

Regulators

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Single Stage Compact Regulator for Ultra High Purity

Series AP500

- For UHP gas delivery
- Flow capacity Standard: to 15 slpm
HF (option): to 30 slpm
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Sub-atmospheric pressure delivery option



RoHS

How to Order

AP5 02 S 2PW FV4 FV4

Port Number
① ② ③

Delivery pressure

Code	Delivery pressure
01	0.5 to 10 psig (0.0034 to 0.07 MPa) Sub-atmospheric (A): 100 mm Hg absolute to 10 psig (-88 kPa to 0.07 MPa)
02	0.5 to 30 psig (0.0034 to 0.2 MPa)
06	1 to 60 psig (0.007 to 0.4 MPa)
10	1 to 100 psig (0.007 to 0.7 MPa)

Ports

Code	Ports
2PW	2 ports
3PWG	3 ports

Range options *1)

Code	Specification
No code	Standard
A	Sub-atmospheric

*1) Only available with AP501.

Option

Code	Specification	Cv
No code	Standard	0.06
FI	Friction dampener *6)	
HF	High flow *7)	0.1

*6) FI is friction dampener to slow response and reduce interaction with MFC.
*7) VS material not available with HF option.

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	Ni-Co alloy	316L SS
SH	secondary remelt	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)

Pressure gauge unit *3)

Code	Unit
No code	psig/bar
MPA	MPa

*3) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Seat material

Code	Material
No code	PCTFE (Standard)
TF	PTFE *4)
VS	Polyimide *5)

*4) PTFE recommended for applications such as within a process tool.
*5) Not available with SH material.

Porting Configuration (Top view)

① IN ② OUT ③ Gauge port (Outlet)

Connections (Inlet ①, Outlet ②)

Code	Connections
FV4	1/4 inch face seal (Female)
MV4	1/4 inch face seal (Male)
TW4	1/4 inch tube weld

Gauge port (Outlet ③)

Code	Connections or Pressure gauge *2)
No code	No gauge port
MV4	No pressure gauge: 1/4 inch face seal (Male)
FV4	pressure gauge: 1/4 inch face seal (Female)
TW4	1/4 inch tube weld
V3	With pressure gauge: -30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	pressure gauge: -30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	pressure gauge: -30 in.Hg to 100 psig -0.1 to 0.7 MPa

*2) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Specifications

Operating Parameters		AP501□□A	AP501	AP502	AP506	AP510
Delivery pressure		100 mm Hg absolute to 10 psig (-88 kPa to 0.07 MPa)	0.5 to 10 psig (0.0034 to 0.07 MPa)	0.5 to 30 psig (0.0034 to 0.2 MPa)	1 to 60 psig (0.007 to 0.4 MPa)	1 to 100 psig (0.007 to 0.7 MPa)
Gas		Select compatible materials of construction for the gas				
Source pressure		Vacuum to 150 psig (1.0 MPa)				
Proof pressure (Inlet)		500 psig (3.4 MPa)				
Burst pressure		1000 psig (6.9 MPa)				
Ambient and operating temperature		-40 to 71°C (No freezing) *1)				
Cv		0.06				
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s				
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)				
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *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				
Supply pressure effect		0.2 psig (0.0014 MPa) rise in delivery pressure per 20 psig (0.14 MPa) source pressure drop				
Installation		Bottom mount				
Internal volume		0.15 in ³ (2.4 cm ³)				
Weight		0.45 kg *3)				

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 100 psig (0.7 MPa).

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

Single Stage Compact Regulator for Ultra High Purity **Series AP500**

Option

High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AP501□□A	AP501	AP502	AP506	AP510
HF	Cv			0.1		
	Supply pressure effect	0.4 psig (0.0028 MPa) rise in delivery pressure per 20 psig (0.14 MPa) source pressure drop				

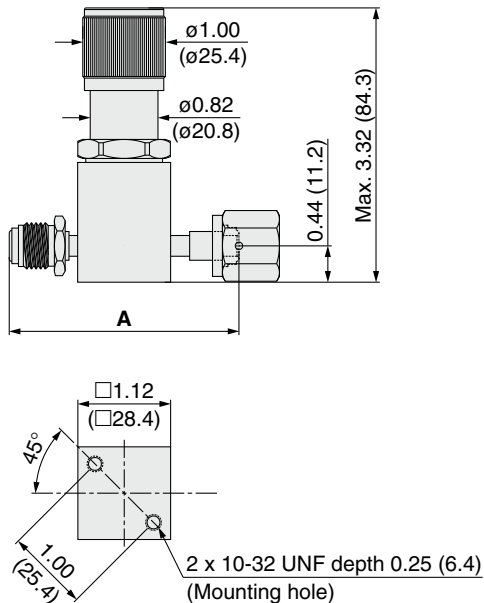
Wetted Parts Material

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

Dimensions

inch (mm)

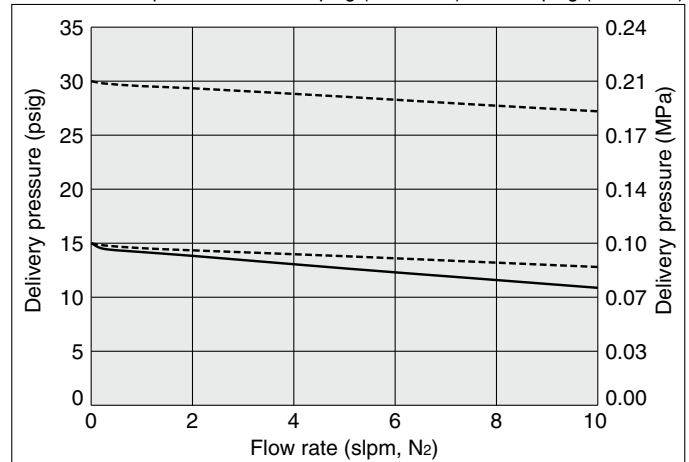
AP500



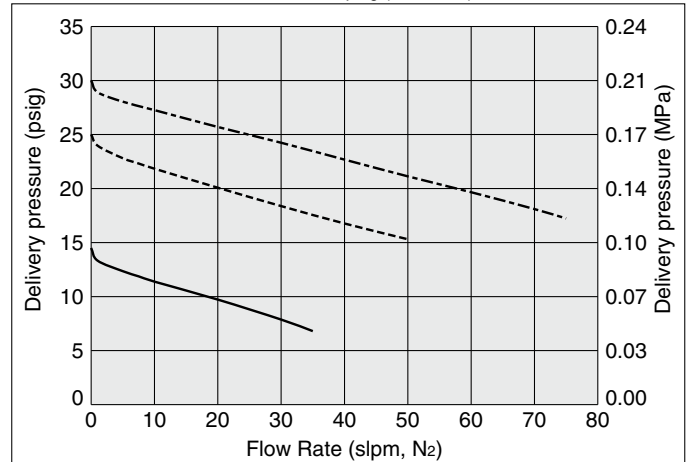
Connections	A	
	inch	(mm)
FV4	2.78	(70.6)
MV4	2.78	(70.6)
TW4	2.12	(53.8)

Flow Characteristics

AP500 Inlet pressure: ---- 100 psig (0.69 MPa) — 30 psig (0.21 MPa)

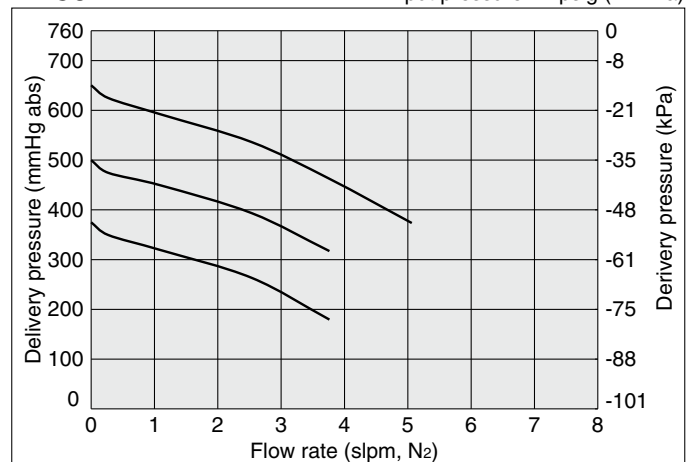


AP500HF Inlet pressure: --- 75 psig (0.52 MPa) --- 45 psig (0.31 MPa) — 30 psig (0.21 MPa)



AP501A

Input pressure : 2 psig (14 kPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity

Low to intermediate flow

Series AP1000

- For UHP gas delivery
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity Standard: to 30 slpm
HF (option): to 120 slpm
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance



RoHS

How to Order

AP10 01 S 2PW FV4 FV4

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
01	1 to 10 psig (0.007 to 0.07 MPa)
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SHP	secondary remelt			
SH		Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy
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
3PW	3 ports
4PW	4 ports

Connections (Inlet ①, Outlet ②)

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

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *1
No code	No gauge port
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	0 to 200 psig 0 to 1.4 MPa
4	0 to 400 psig 0 to 3 MPa
40	0 to 4000 psig 0 to 28 MPa

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *6)

*6) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Option

Code	Specification
No code	Standard (Cv: 0.09)
HF	High flow (Cv: 0.15)

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide *3)
TF	PTFE *4) *5)

*3) Not available with SHP, SH, H materials.
*4) PTFE recommended for applications such as within a process tool.
*5) Source pressure rating is limited to 300 psig (2.1 MPa) or less.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Sample Order Number

Port	①	②	③	④
AP1001S	2PW	FV4	FV4	
3PW	FV4	FV4	0	
3PW	FV4	FV4	V3	MPA
4PW	FV4	FV4	1	V3 MPA

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Specifications

Operating Parameters		AP1001	AP1002	AP1006	AP1010	AP1015
Delivery pressure		1 to 10 psig (0.007 to 0.07 MPa)	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas				
Source pressure		Vacuum to 300 psig (2.1 MPa) Vacuum to 3500 psig (24.1 MPa) *1)				
Proof pressure (Inlet)		5000 psig (34.5 MPa)				
Burst pressure		10000 psig (69 MPa)				
Ambient and operating temperature		-40 to 71°C (No freezing) *2)				
Cv		0.09				
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s				
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *3)				
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *4)				
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				
Bonnet port		NPT 1/8 inch *5)				
Supply pressure effect		0.38 psig (0.0026 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				
Installation		Bottom mount (Option: panel mount)				
Internal volume		0.49 in ³ (8 cm ³)				
Weight		1.25 kg *6)				

*1) Max. 300 psig (2.1 MPa) for PTFE seat.

*2) Max. 90°C for Polyimide seat.

*3) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*4) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

*5) On panel mount option, bonnet port is not threaded.

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

Single Stage Regulator for Ultra High Purity *Series AP1000*

Low to intermediate flow

Option

High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AP1001	AP1002	AP1006	AP1010	AP1015
HF	Cv			0.15		
	Supply pressure effect	0.75 psig (0.0052 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				

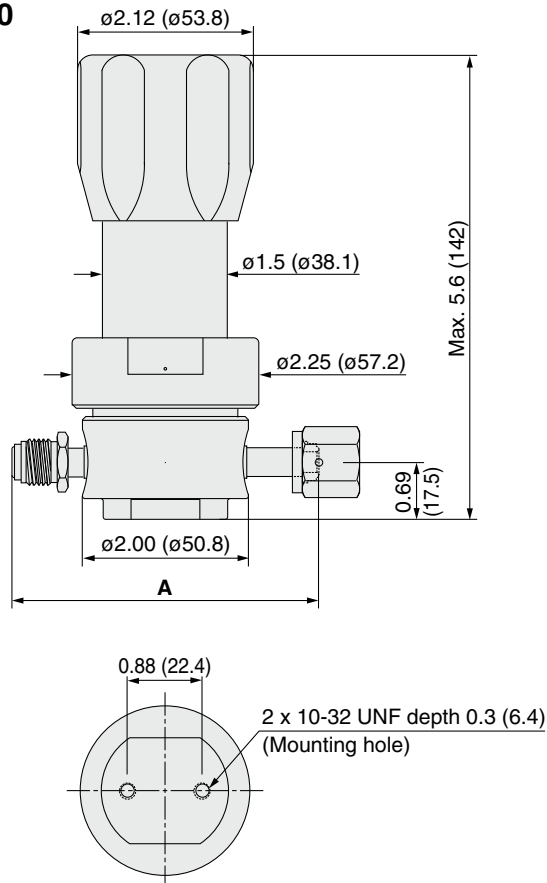
Wetted Parts Material

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

Dimensions

inch (mm)

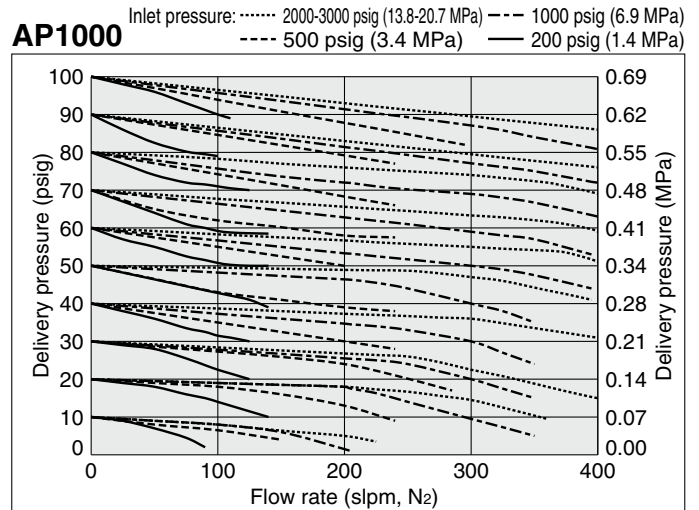
AP1000



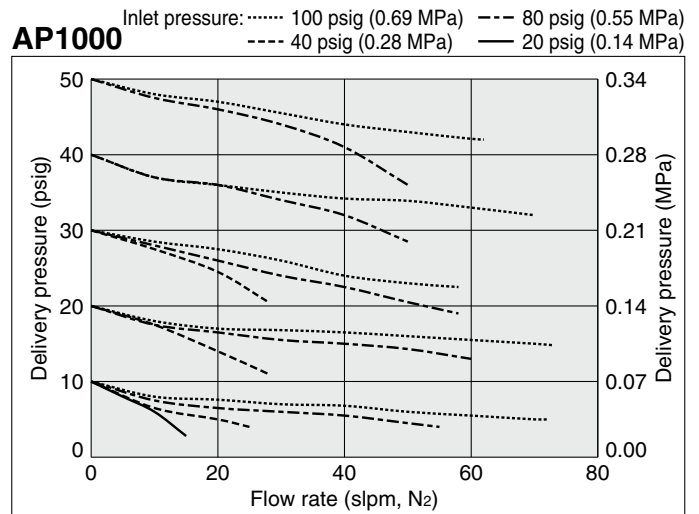
Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4	3.70	(94.0)
TW4	2.96	(75.2)
FV6	4.70	(119.4)
MV6	4.70	(119.4)
TW6	2.96	(75.2)

Flow Characteristics

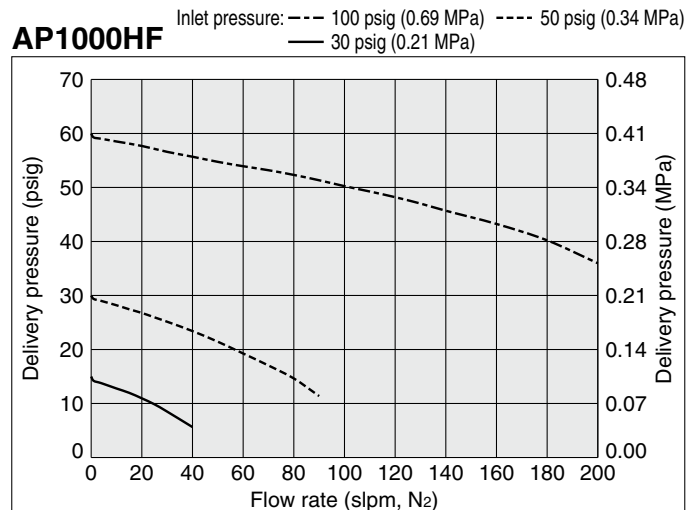
AP1000



AP1000



AP1000HF



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity

Low flow
(Tied-diaphragm)

Series AP1500

- For UHP gas delivery
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity: to 30 slpm
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Tied-diaphragm design



RoHS

How to Order

AP15 02 S 2PW FV4 FV4

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SHP	secondary remelt	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy
SH				
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 port
3PW	3 port
4PW	4 port

Connections (Inlet①, Outlet②)

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

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *4)

*4) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Seat material

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

*3) Not available with SHP, SH, H materials.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Gauge port (Inlet③, Outlet④)

Code	Pressure gauge *1)
No code	No pressure gauge
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	0 to 200 psig 0 to 1.4 MPa
40	0 to 4000 psig 0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Sample Order Number

Port	①	②	③	④
AP1510S	2PW	FV4	FV4	
	3PW	FV4	FV4	0
	3PW	FV4	FV4	1 MPA
	4PW	FV4	FV4	40 1 MPA

Specifications

Operating Parameters		AP1502	AP1506	AP1510	AP1515
Delivery pressure		1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas			
Source pressure		Vacuum to 3500 psig (24.1 MPa)			
Proof pressure (Inlet)		5000 psig (34.5 MPa)			
Burst pressure		10000 psig (69MPa)			
Ambient and operating temperature		-40 to 71°C (No freezing) *1)			
Cv		0.09			
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s			
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)			
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)			
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			
Bonnet port		NPT 1/8 inch *4)			
Supply pressure effect		0.41 psig (0.0028 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop			
Installation		Bottom mount (Option: panel mount)			
Internal volume		0.51 in ³ (8.4 cm ³)			
Weight		1.27 kg *5)			

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*3) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

*4) On panel mount option, bonnet port is not threaded.

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

Single Stage Regulator for Ultra High Purity *Series AP1500*

Low flow (Tied-diaphragm)

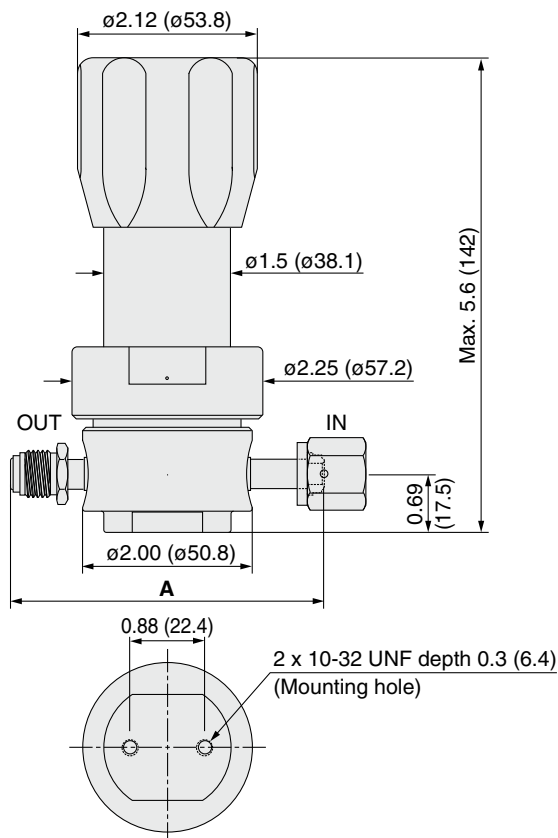
Wetted Parts Material

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

Dimensions

inch (mm)

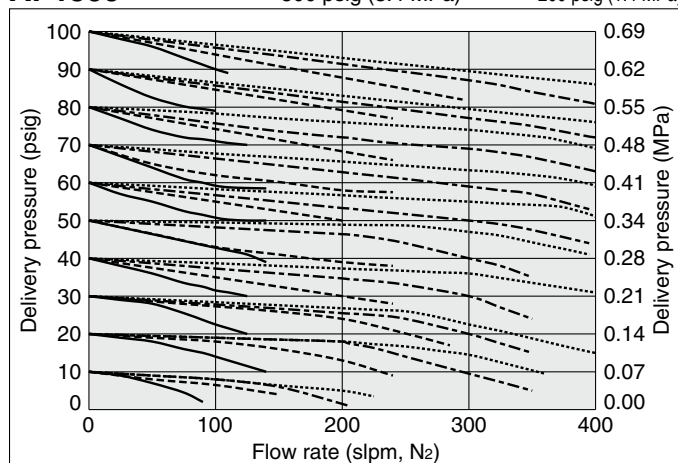
AP1500



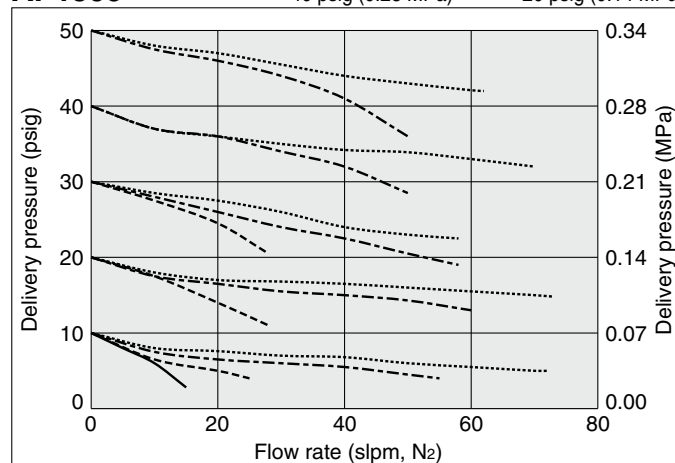
Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4	2.96	(75.2)
TW4	2.96	(75.2)
FV6	4.70	(119.4)
MV6	4.70	(119.4)
TW6	2.96	(75.2)

Flow Characteristics

AP1500 Inlet pressure: 2000 to 3000 psig (13.8 to 20.7 MPa) --- 1000 psig (6.9 MPa)
 ----- 500 psig (3.4 MPa) ——— 200 psig (1.4 MPa)



AP1500 Inlet pressure: 100 psig (0.69 MPa) --- 80 psig (0.55 MPa)
 ----- 40 psig (0.28 MPa) ——— 20 psig (0.14 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity

Low to intermediate flow

Series AP1600

- For UHP gas delivery
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity: to 100 slpm
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance



RoHS

How to Order

AP16 01 S 2PW FV4 FV4

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
01	1 to 10 psig (0.007 to 0.07 MPa)
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SH	secondary remelt	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	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
3PW	3 ports
4PW	4 ports

Connections (Inlet①, Outlet②)

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

Gauge port (Inlet③, Outlet④)

Code	Pressure gauge *1
	psig/bar unit MPa unit
No code	No gauge port
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	0 to 200 psig 0 to 1.4 MPa
40	0 to 4000 psig 0 to 28 MPa

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *4)

*4) Panel mounting hole: dia. 1.43 inch (36.3 mm).

Seat material

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

*3) Not available with SH material.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPa	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Sample Order Number

Port	①	②	③	④
AP1601S	2PW	FV4	FV4	
	3PW	FV4	FV4	0
	3PW	FV4	FV4	V3 MPA
	4PW	FV4	FV4	1 V3 MPA
	4PW	FV4	FV4	0 0

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Specifications

Operating Parameters		AP1601	AP1602	AP1606	AP1610
Delivery pressure		1 to 10 psig (0.007 to 0.07 MPa)	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)
Gas		Select compatible materials of construction for the gas			
Source pressure		Vacuum to 100 psig (0.7 MPa)	Vacuum to 3500 psig (24.1 MPa)		
Proof pressure (Inlet)		4000 psig (27.6 MPa)			
Burst pressure		8000 psig (55.2 MPa)			
Ambient and operating temperature		-40 to 71°C (No freezing) *1)			
Cv		0.13			
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m³/s			
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m³/s *2)			
Across the seat leak		4 x 10 ⁻⁹ Pa·m³/s *3)			
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			
Bonnet port		NPT 1/8 inch *4)			
Supply pressure effect		0.25 psig (0.0017 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop			
Installation		Bottom mount (Option: panel mount)			
Internal volume		0.82 in³ (13.5 cm³)			
Weight		1.54 kg *5)			

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

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

*4) On panel mount option, bonnet port is not threaded.

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

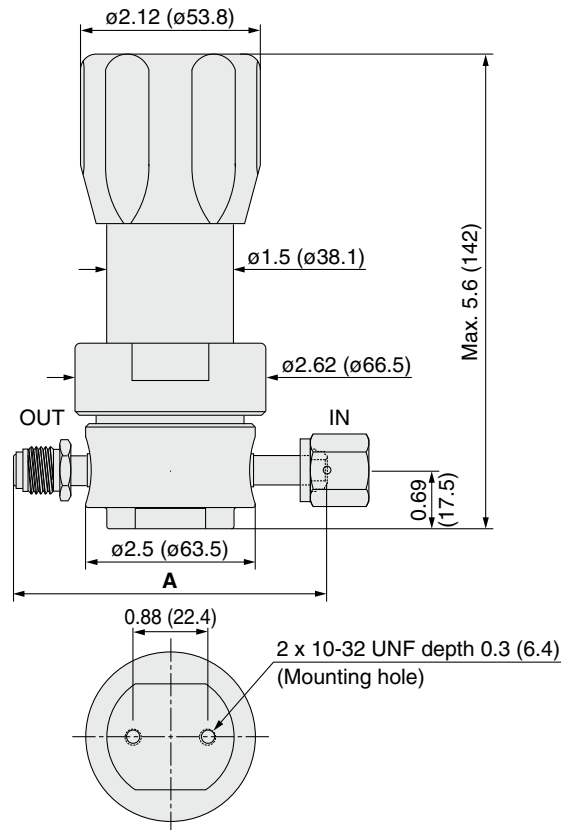
Wetted Parts Material

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

Dimensions

inch (mm)

AP1600

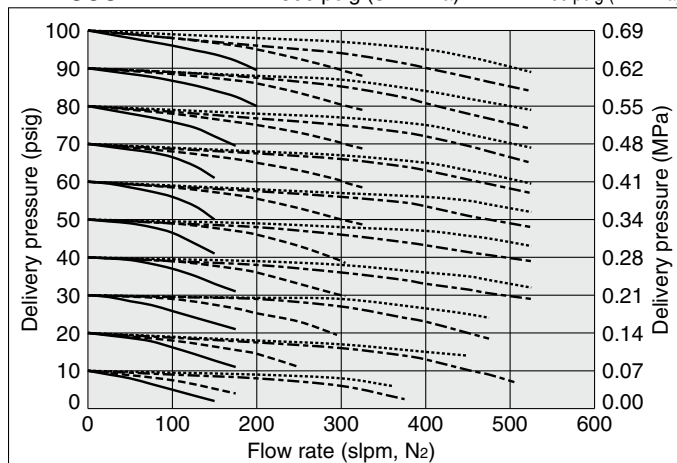


Connections	A	
	inch	(mm)
FV4	4.30	(109.2)
MV4		
TW4	3.46	(87.9)
FV6	5.22	(132.6)
MV6		
TW6	4.00	(101.6)

Flow Characteristics

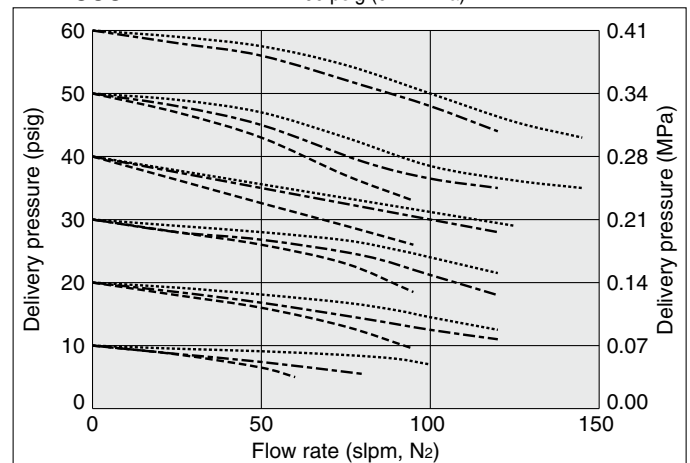
AP1600

Inlet pressure: 2000 to 3000 psig (13.8 to 20.7 MPa) --- 1000 psig (0.69 MPa)
----- 500 psig (3.4 MPa) — 200 psig (1.4 MPa)



AP1600

Inlet pressure: 100 psig (0.69 MPa) --- 80 psig (0.55 MPa)
----- 60 psig (0.41 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity

Low to intermediate flow
(Tied-diaphragm)

Series AP1900

- For UHP gas delivery
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Tied-diaphragm design



RoHS

How to Order

AP19 01 S 2PW FV4 FV4

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
01	1 to 10 psig (0.007 to 0.07 MPa)
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SH	secondary remelt	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	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
3PW	3 ports
4PW	4 ports

Connections (Inlet ①, Outlet ②)

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
FV8	1/2 inch face seal (Female)
MV8	1/2 inch face seal (Male)
TW8	1/2 inch tube weld

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *1)
	psig/bar unit MPa unit
No code	No gauge port
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	0 to 200 psig 0 to 1.4 MPa
40	0 to 4000 psig 0 to 28 MPa

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *4)

*4) Panel mounting hole: dia.1.43 inch (36.3 mm).

Option

Code	Specification
No code	Standard (Cv: 0.13)
HF	High flow (Cv: 0.16)

Seat material

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

*3) Not available with SH material.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

Porting Configuration

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Sample Order Number

Port	①	②	③	④
AP1901S	2PW	FV4	FV4	
	3PW	FV4	FV4	0
	3PW	FV4	FV4	V3 MPA
	4PW	FV4	FV4	40 V3 MPA
	4PW	FV4	FV4	0 0

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Specifications

Operating Parameters		AP1901	AP1902	AP1906	AP1910	AP1915
Delivery pressure		1 to 10 psig (0.007 to 0.07 MPa)	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas				
Source pressure		Vacuum to 3500 psig (24.1 MPa)				
Proof pressure (Inlet)		4000 psig (27.6 MPa)				
Burst pressure		8000 psig (55.2 MPa)				
Ambient and operating temperature		-40 to 71°C (No freezing) *1)				
Cv		0.13				
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s				
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)				
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)				
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				
Bonnet port		NPT 1/8 inch *4)				
Supply pressure effect		0.25 psig (0.0017 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				
Installation		Bottom mount (Option: panel mount)				
Internal volume		0.82 in ³ (13.5 cm ³)				
Weight		1.54 kg *5)				

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*3) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

*4) On panel mount option, bonnet port is not threaded.

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

Single Stage Regulator for Ultra High Purity *Series AP1900*

Low to intermediate flow (Tied-diaphragm)

Option

High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AP1901	AP1902	AP1906	AP1910	AP1915
HF	Cv			0.16		
	Supply pressure effect	0.6 psig (0.0042 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				

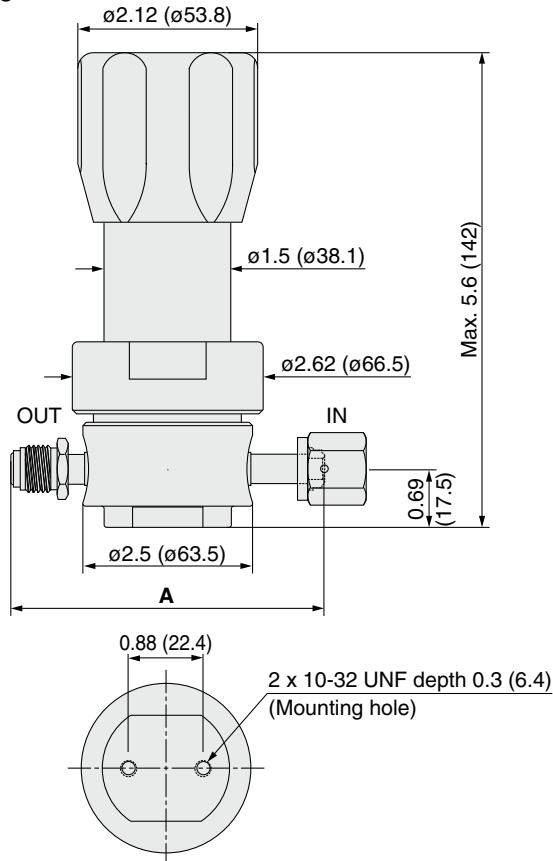
Wetted Parts Material

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

Dimensions

inch (mm)

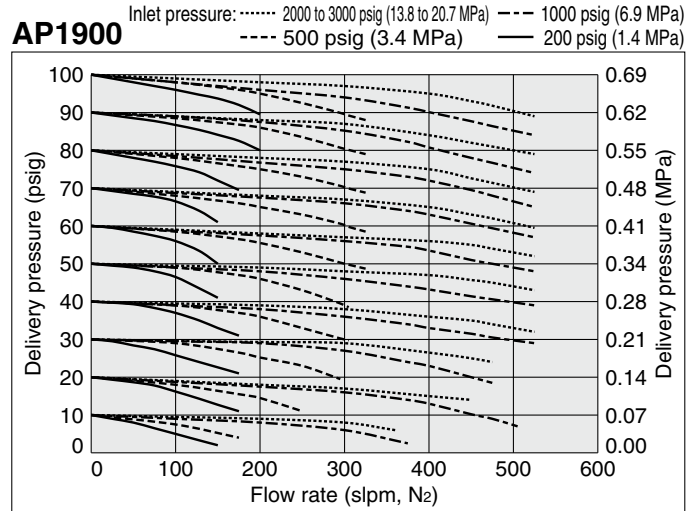
AP1900



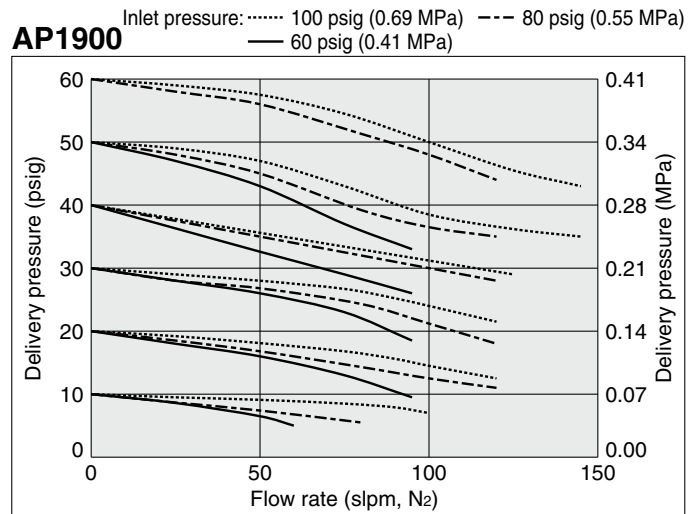
Connections	A	
	inch	(mm)
FV4	4.30	(109.2)
MV4	3.46	(87.9)
FW6	5.22	(132.6)
MV6	4.00	(101.6)
FW8	5.22	(132.6)
MV8	4.34	(110.2)

Flow Characteristics

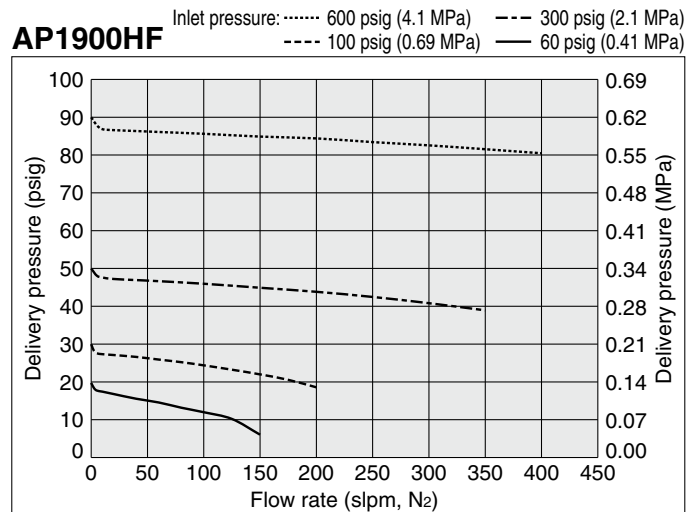
AP1900



AP1900



AP1900HF



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity

Intermediate flow
(Tied-diaphragm)

Series AP1400T

- For UHP gas delivery
- High inlet pressure type Standard: Max. 2300 psig (15.9 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity: to 400 slpm
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals standard
- Sub-atmospheric pressure delivery option
- Tied-diaphragm design



RoHS

How to Order

AP14 02 T S 2PW FV4 FV4

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa) Sub-atmospheric(A): 100 mm Hg absolute to 30 psig (-88 kPa to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS secondary remelt	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	316L SS
SH	316L SS secondary remelt	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	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)

Range options *1)

Code	Range
No code	Standard
A	Sub-atmospheric

*1) Only available with AP1402T.

Connections (Inlet①, Outlet②)

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
FV8	1/2 inch face seal (Female)
MV8	1/2 inch face seal (Male)
TW8	1/2 inch tube weld

Gauge port (Inlet③, Outlet④)

Code	Pressure gauge *2)
	psig/bar unit MPa unit
No code	No gauge port
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	0 to 200 psig 0 to 1.4 MPa
4	0 to 400 psig 0 to 3 MPa
40	0 to 4000 psig 0 to 28 MPa

*2) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *6)
SC	Short type *7)

*6) Panel mounting hole: 1.56 inch (39.6 mm).
*7) Bonnet port is not threaded. SC option not available with 1402TA option.

Option

Code	Specification
No code	Standard
HR	High inlet pressure (Max. inlet pressure 3000 psig (20.7 MPa)) *5)

*5) Not available with AP1402T and AP1406T.

Seat material

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

*4) Not available with SH material.

Pressure gauge unit *3)

Code	Unit
No code	psig/bar
MPA	MPa

*3) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

Sample Order Number

Port	①	②	③	④
AP1410T	2PW	FV4	FV4	
	3PW	FV4	FV4	0
	3PW	FV4	FV4	1 MPa
	4PW	FV4	FV4	40 1 MPa
	4PW	FV4	FV4	0 0

Specifications

Operating Parameters	AP1402T□□A	AP1402T	AP1406T	AP1410T	AP1415T
Delivery pressure	100 mm Hg absolute to 30 psig (-88 kPa to 0.2 MPa)	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa) (Source pressure 1000 psig or less) *1)
Gas	Select compatible materials of construction for the gas				
Source pressure	Vacuum to 2300 psig (15.9 MPa)				
Proof pressure (Inlet)	4000 psig (27.6 MPa)				
Burst pressure	8000 psig (55.2 MPa)				
Ambient and operating temperature	-40 to 71°C (No freezing) *2)				
Cv	0.45				
Leak rate	2 x 10 ⁻¹¹ Pa·m ³ /s				
Inboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *3)				
Outboard leakage	4 x 10 ⁻⁹ Pa·m ³ /s *4)				
Across the seat leak	Ra max 15 μin. (0.4 μm) Option: 10 μin. (0.25 μm), 7 μin. (0.18 μm), 5 μin. (0.13 μm)				
Surface finish	Face seal, Tube weld				
Connections	NPT 1/8 inch *5)				
Bonnet port	Bottom mount (Option: panel mount)				
Supply pressure effect	1.6 psig(0.011 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				
Installation	1.06 in ³ (17.4 cm ³)				
Internal volume	2.04 kg *6)				
Weight					

*1) Source pressure above 1000 psig (6.9 MPa) decreases maximum delivery pressure to less than 150 psig (1 MPa) due to supply pressure effect. When the source pressure is 2300 psig (15.9 MPa), achievable delivery pressure is around 129 psig (0.89 MPa).

*2) Max. 90°C for Polyimide seat.

*3) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*4) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

*5) On panel mount option, bonnet port is not threaded.

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

Series AP1400T

Option	Other Parameters	AP1410T	AP1415T
HR	Source pressure	Vacuum to 3000 psig (20.7 MPa)	
	Proof pressure (Inlet)	4500 psig (31 MPa)	
	Burst pressure	9000 psig (62 MPa)	

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

Connections	A		B	
	inch	(mm)	inch	(mm)
FV4	2.00	(50.8)	3.70	(94.0)
MV4			4.00	(101.6)
TW4			3.46	(87.9)
FV6	2.50	(63.5)	5.22	(132.6)
MV6			4.00	(101.6)
TW6			5.22	(132.6)
FV8			4.34	(110.2)
MV8			4.34	(110.2)
TW8				

Single Stage Regulator for Ultra High Purity

High flow
(Tied-diaphragm)

Series AP1200

- For UHP gas delivery
- High inlet pressure type Standard: Max. 1700 psig (11.7 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity Standard: to 800 slpm
HF (option): to 1000 slpm
FC (option): to 1500 slpm

- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Tied-diaphragm design



RoHS

How to Order

AP12 **02** **S** **2PW** **FV8** **FV8**

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)
25	Preset to 250 psig (1.7 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS		
SHP	secondary remelt	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	316L SS
SH				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
3PW	3 ports
4PW	4 ports

Connections (Inlet^①, Outlet^②)

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
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) *1)
MV12	3/4 inch face seal (Male) *1)
TW12	3/4 inch tube weld

*1) Prepare a suitable mating fitting with a rated pressure.

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *7)
SC	Short type *8)

*7) Panel mounting hole: dia. 1.56 inch (39.6 mm).
*8) Bonnet port is not threaded.
SC option not available with FC or HR option.

Option

Code	Specification
No code	Standard (Cv: 0.65)
HF	High flow (Cv: 1.1)
FC	Force compensation (Cv: 0.65) *5)*6)
HR	High inlet pressure (Max. inlet pressure 3000 psig (20.7 MPa)) *5)

*5) FC and HR options are not available with AP1202, AP1206 and AP1225.
*6) FC option is available with connection size 1/2 or 3/4 inch.

Pressure gauge unit *3)

Code	Unit
No code	psig/bar
MPA	MPa

*3) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Gauge port (Inlet^③, Outlet^④)

Code	Pressure gauge *2)
No code	No gauge port
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	0 to 200 psig 0 to 1.4 MPa
40	0 to 4000 psig 0 to 28 MPa

*2) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Sample Order Number

Port	①	②	③	④
AP1210S	2PW	FV8	FV8	
	3PW	FV8	FV8	0
	3PW	FV8	FV8	1 MPA
	4PW	FV8	FV8	40 1 MPA
	4PW	FV8	FV8	0 0

Seat material

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

*4) Not available with SHP and SH materials.

Specifications

Operating Parameters		AP1202	AP1206	AP1210	AP1215	AP1225
Delivery pressure		1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa) (Source pressure 1000 psig or less) *1)	Preset to 250 psig (1.7 MPa) *2)
Gas		Select compatible materials of construction for the gas				
Source pressure		Vacuum to 1700 psig (11.7 MPa)				
Proof pressure (Inlet)		2550 psig (17.6 MPa)				
Burst pressure		8000 psig (55.2 MPa)				
Ambient and operating temperature		-40 to 71°C (No freezing) *3)				
Cv		0.65				
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m³/s				
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m³/s *4)				
Across the seat leak		4 x 10 ⁻⁹ Pa·m³/s *5)				
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				
Bonnet port		NPT 1/8 inch *6)				
Supply pressure effect		3.5 psig (0.024 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				
Installation		Bottom mount (Option: panel mount)				
Internal volume		1.07 in³ (17.6 cm³)				
Weight		2.0 kg *7)				

- *1) Source pressure above 1000 psig (6.9 MPa) decreases maximum delivery pressure to less than 150 psig (1 MPa) due to supply pressure effect. When the source pressure is 1700 psig (11.7 MPa), achievable delivery pressure is around 125 psig (0.86 MPa) (HF and FC option 120 psig (0.83 MPa)).
- *2) 250 psig outlet pressure preset at 800 psig (5.5 MPa) inlet pressure. Custom inlet/outlet pressure settings available. Please contact SMC.
- *3) Max. 90 °C for Polyimide seat.
- *4) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).
- *5) Tested with Helium gas inlet pressure 1000 psig (7 MPa).
- *6) On panel mount option, bonnet port is not threaded.
- *7) Weight, including individual boxed weight, may vary depending on connections or options.

Single Stage Regulator for Ultra High Purity *Series AP1200*

High flow (Tied-diaphragm)

Options

1. High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AP1202	AP1206	AP1210	AP1215	AP1225
HF	Cv	1.1				
	Supply pressure effect	4.2 psig (0.029 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				
	Connections	1/2, 3/4 inch face seal, 1/2, 3/4 inch tube weld				

2. Force compensation

Force compensation feature added to HF option and has wider flow capacity than HF option. Changes from the standard type are:

Option	Other Parameters	AP1210	AP1215
FC	Source pressure	Vacuum to 300 psig (2.1 MPa)	
	Cv	0.65	
	Supply pressure effect	4.2 psig (0.029 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop	
	Connections	1/2, 3/4 inch face seal, 1/2, 3/4 inch tube weld	

3. High inlet pressure

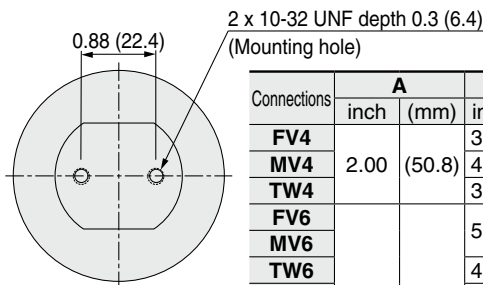
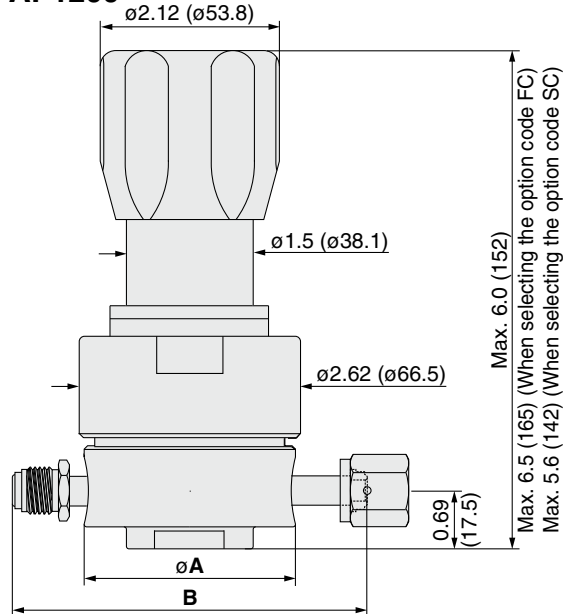
Changes from the standard type are:

Option	Other Parameters	AP1210	AP1215
HR	Source pressure	Vacuum to 3000 psig (20.7 MPa)	
	Proof pressure (Inlet)	4500 psig (31 MPa)	
	Burst pressure	9000 psig (62 MPa)	

Dimensions

inch (mm)

AP1200

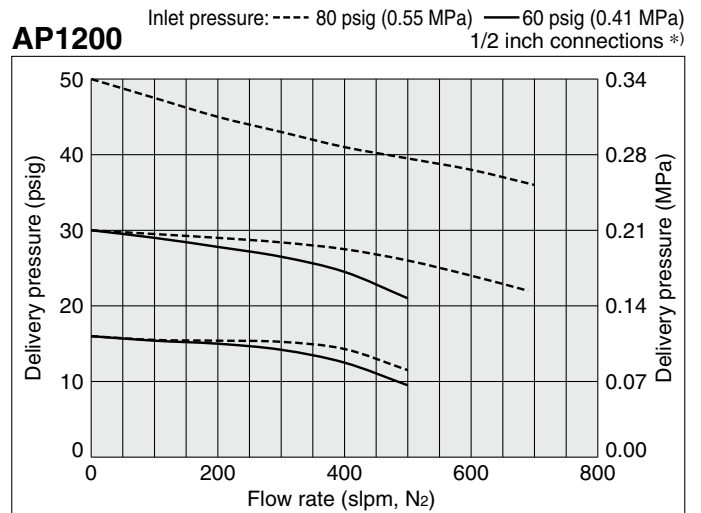


Connections	A		B	
	inch	(mm)	inch	(mm)
FV4	2.00	(50.8)	3.70	(94.0)
MV4			4.00	(101.6)
TW4			3.46	(87.9)
FV6			5.22	(132.6)
MV6			4.00	(101.6)
TW6			4.00	(101.6)
FV8	2.50	(63.5)	5.22	(132.6)
MV8			4.34	(110.2)
TW8			6.26	(159.0)
FV12			5.00	(127.0)
MV12				
TW12				

Wetted Parts Material

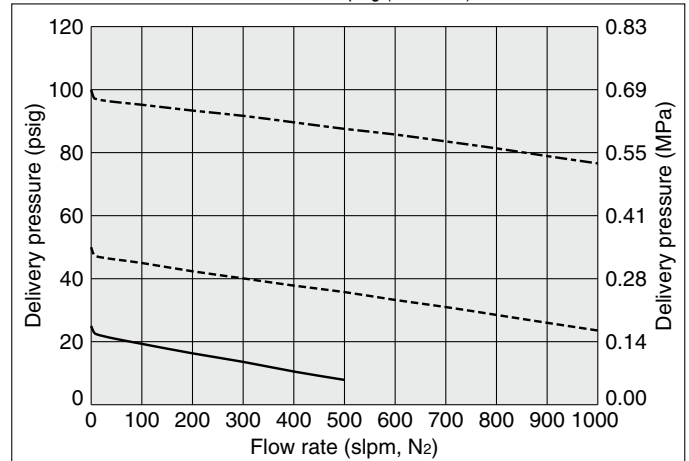
Wetted Parts	S	SHP	SH
Body	316L SS secondary remelt		
Surface finish	Electropolish + Passivation		
Poppet	316L SS	Ni-Cr-Mo alloy	
Diaphragm	Ni-Cr-Mo alloy		
Nozzle	316L SS		Ni-Cr-Mo alloy
Seat	PCTFE (Option: Polyimide)	PCTFE	

Flow Characteristics



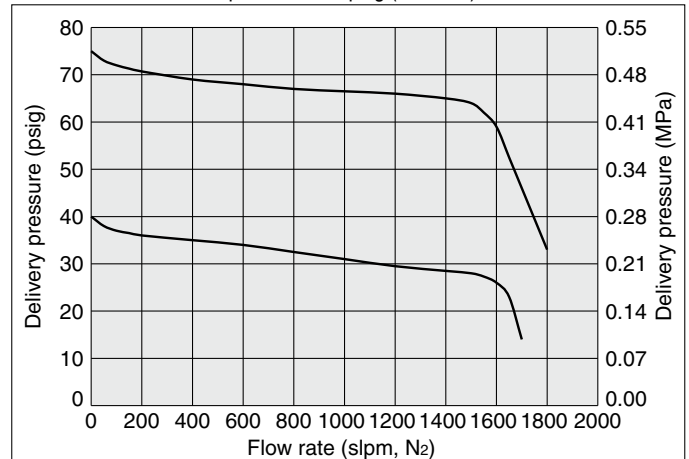
AP1200HF

Inlet pressure: --- 150 psig (1.0 MPa) --- 100 psig (0.69 MPa)
— 50 psig (0.35 MPa)



AP1200FC

Inlet pressure: 150 psig (1.0 MPa) 3/4 inch connections *



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity

Delivery of sub-atmospheric pressure

Series AP1100

- For UHP gas delivery
- Sub-atmospheric to low positive pressure delivery
- Flow capacity: to 0.5 slpm
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance



RoHS

How to Order

AP11 01 S 2PW FV4 FV4

Delivery pressure

Code	Delivery pressure
01	100 mm Hg absolute to 10 psig (-88 kPa to 0.07 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SHP	secondary remelt			
SH	remelt	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	
H	Ni-Cr-Mo alloy			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
3PW	3 ports
4PW	4 ports

Connections (Inlet ①, Outlet ②)

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

Sample Order Number

Port	①	②	③	④
AP1101S	2PW	FV4	FV4	
	3PW	FV4	FV4	0
	3PW	FV4	FV4	V3 MPA
	4PW	FV4	FV4	V3 V3 MPA
	4PW	FV4	FV4	0 0

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *4)

*4) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Seat material

Code	Material
No code	PCTFE (Standard)
TF	PTFE *3)

*3) PTFE recommended for applications such as within a process tool.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *1)	psig/bar unit	MPa unit
No code	No gauge port		
0	No pressure gauge (Connections: 1/4 inch face seal male)		
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa	
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa	
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa	
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa	
2	0 to 200 psig	0 to 1.4 MPa	
4	0 to 400 psig	0 to 3 MPa	

*1) Other range available. Refer to gauge guide (P.115). Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Porting Configuration

① IN ② OUT ③ Gauge port (Inlet)
④ Gauge port (Outlet)

Specifications

Operating Parameters		AP1101
Delivery pressure		100 mm Hg absolute to 10 psig (-88 kPa to 0.07 MPa)
Gas		Select compatible materials of construction for the gas
Source pressure		Vacuum to 300 psig (2.1 MPa)
Proof pressure (Inlet)		500 psig (3.4 MPa)
Burst pressure		8000 psig (55.2 MPa)
Ambient and operating temperature		-40 to 71°C (No freezing)
Cv		0.05
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *1)
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /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
Bonnet port		NPT 1/8 inch *2)
Installation		Bottom mount (Option: panel mount)
Internal volume		0.49 in ³ (8 cm ³)
Weight		1.25 kg *3)

*1) Tested with Helium gas inlet pressure 300 psig (2.1 MPa).

*2) On panel mount option, bonnet port is not threaded.

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

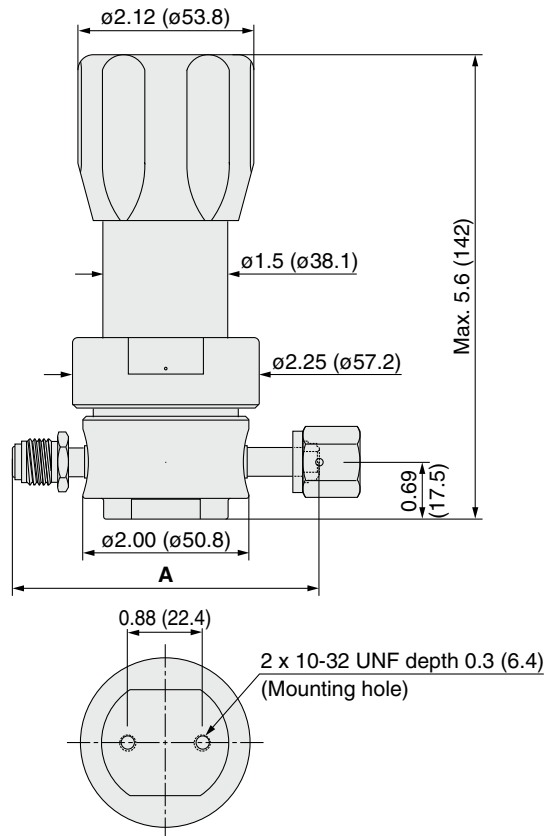
Wetted Parts Material

Wetted Parts	S	SHP	SH	H
Body	316L SS secondary remelt			Ni-Cr-Mo alloy
Surface finish	Electropolish + Passivation			Electropolish
Poppet	316L SS	Ni-Cr-Mo alloy		
Diaphragm	316L SS	Ni-Cr-Mo alloy		
Nozzle	316L SS		Ni-Cr-Mo alloy	
Seat	PCTFE (Option: PTFE)			

Dimensions

inch (mm)

AP1100

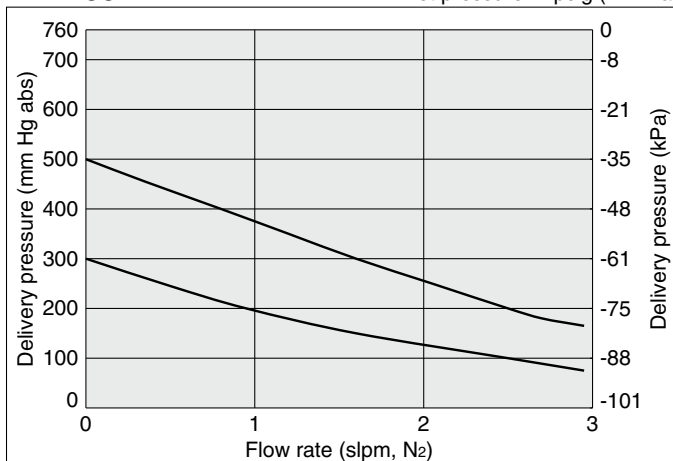


Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4	3.70	(94.0)
TW4	2.96	(75.2)
FV6	4.70	(119.4)
MV6	4.70	(119.4)
TW6	2.96	(75.2)

Flow Characteristics

AP1100

Inlet pressure: 2 psig (14 kPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Two Stage Regulator for Ultra High Purity

Low flow
(Tied-diaphragm)

Series AP1700

- For UHP gas delivery
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Minimizes supply pressure effect by two stage regulation
- Tied-diaphragm design



RoHS

How to Order

AP17 02 S 2PW FV4 FV4

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)

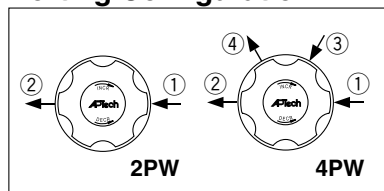
Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SH	secondary remelt	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	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)

Porting Configuration



- ① IN ② OUT ③ Gauge port (Inlet)
④ Gauge port (Outlet)

Ports

Code	Ports
2PW	2 ports
4PW	4 ports

Connections (Inlet①, Outlet②)

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

Gauge port (Inlet③, Outlet④)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch face seal male)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
2	0 to 200 psig	0 to 1.4 MPa
40	0 to 4000 psig	0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Sample Order Number

Port	①	②	③	④
AP1702S	2PW	FV4	FV4	
	4PW	FV4	FV4	0
	4PW	FV4	FV4	40

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *4)

*4) Panel mounting hole:
dia. 1.56 inch (39.6 mm).

Seat material

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

*3) Not available with SH material.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Specifications

Operating Parameters		AP1702	AP1706	AP1710
Delivery pressure		1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)
Gas		Select compatible materials of construction for the gas		
Source pressure		Vacuum to 3500 psig (24.1 MPa)		
First stage pressure		175 psig (1.2 MPa)		
Proof pressure (Inlet)		4000 psig (27.6 MPa)		
Burst pressure		8000 psig (55.2 MPa)		
Ambient and operating temperature		-40 to 71°C (No freezing) *1)		
Cv		0.05		
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s		
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)		
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)		
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		
Bonnet port		NPT 1/8 inch *4)		
Supply pressure effect		0.05 psig (0.00035 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop		
Installation		Option: panel mount		
Internal volume		0.92 in ³ (15.1 cm ³)		
Weight		2.04 kg *5)		

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*3) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

*4) On panel mount option, bonnet port is not threaded.

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

Wetted Parts Material

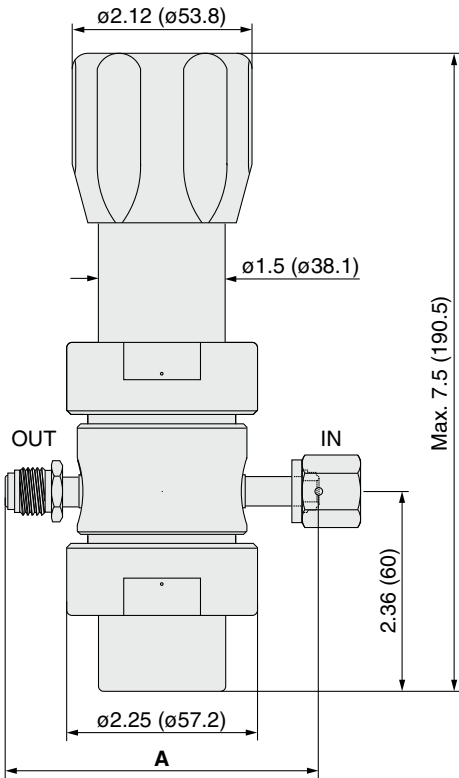
Wetted Parts	S	SH
Body	316L SS secondary remelt	
Surface finish	Electropolish + Passivation	
Poppet	316L SS	Ni-Cr-Mo alloy
Diaphragm	316L SS	Ni-Cr-Mo alloy
Nozzle	316L SS	Ni-Cr-Mo alloy
Seat	PCTFE (Option: Polyimide)	PCTFE

Dimensions

inch (mm)

AP1700

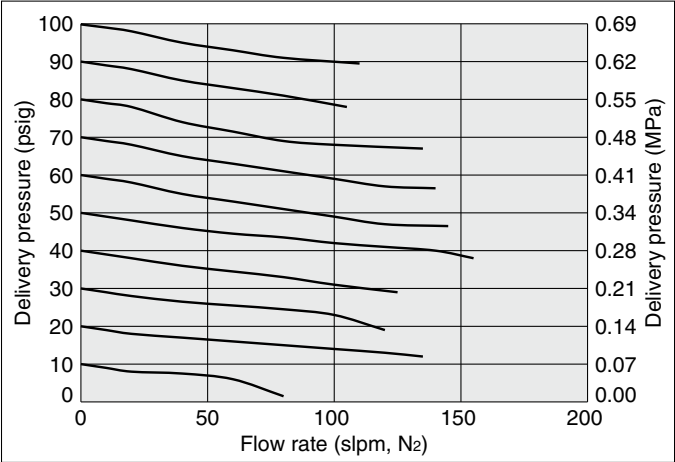
Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4	2.96	(75.2)
TW4	2.96	(75.2)
FV6	4.70	(119.4)
MV6	2.96	(75.2)
TW6	2.96	(75.2)



Flow Characteristics

AP1700

Inlet pressure: 200 to 3000 psig (1.4 to 20.7 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Two Stage Regulator for Ultra High Purity

Intermediate flow
(Tied-diaphragm)

Series AP2700

- For UHP gas delivery
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity to 150 slpm (NF₃)
to 900 slpm (H₂)
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Minimizes supply pressure effect by two stage regulation

- Tied-diaphragm design



RoHS

How to Order

AP27 02 S 2PW FV4 FV4

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
12	3 to 120 psig (0.021 to 0.8 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS secondary remelt	316L SS	316L SS/ Ni-Cr-Mo alloy	316L SS
SH		Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	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)

Connections (Inlet①, Outlet②)

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

Ports

Code	Ports
2PW	2 ports
3PWQ	3 ports (1 pressure monitor port (MP))
4PW	4 ports
5PWQ	5 ports (1 pressure monitor port (MP))

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *4)

*4) Panel mounting hole:
dia. 1.56 inch (39.6 mm).

Seat material

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

*3) Not available with SH material.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration

Gauge port (Inlet③, Outlet④)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch face seal male)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
2	0 to 200 psig	0 to 1.4 MPa
40	0 to 4000 psig	0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Sample Order Number

Port		③	④
AP2702S	2PW FV4 FV4		
	3PWQ FV4 FV4		
	4PW FV4 FV4	40	V3 MPA
	5PWQ FV4 FV4	40	V3 MPA

Specifications

Operating Parameters		AP2702	AP2706	AP2710	AP2712
Delivery pressure		1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	3 to 120 psig (0.021 to 0.8 MPa)
Gas		Select compatible materials of construction for the gas			
Source pressure		Vacuum to 3500 psig (24.1 MPa)			
First stage pressure		200 psig (1.4 MPa)			
Proof pressure (Inlet)		4000 psig (27.6 MPa)			
Burst pressure		8000 psig (55.2 MPa)			
Ambient and operating temperature		-40 to 71°C (No freezing) *1)			
Cv		0.105			
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s			
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)			
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)			
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			
Bonnet port		NPT 1/8 inch *4)			
Supply pressure effect		0.01 psig (0.00007 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop			
Installation		Option: panel mount			
Internal volume		1.87 in ³ (30.6 cm ³)			
Weight		2.27 kg *5)			

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*3) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

*4) On panel mount option, bonnet port is not threaded.

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

Two Stage Regulator for Ultra High Purity

Intermediate flow (Tied-diaphragm) **Series AP2700**

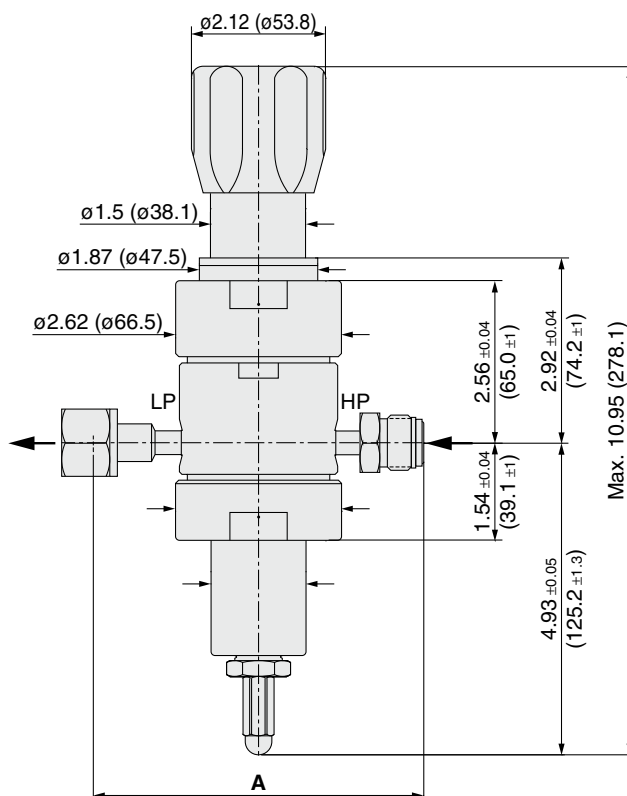
Wetted Parts Material

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

Dimensions

inch (mm)

AP2700

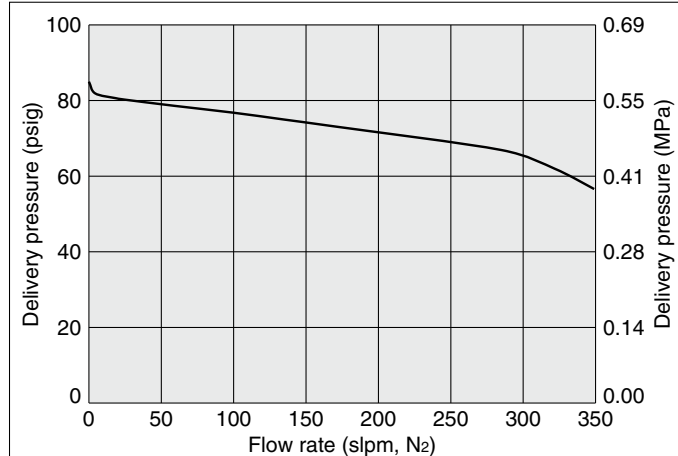


Connections	A	
	inch	(mm)
FV4	4.30	(109.2)
MV4	4.30	(109.2)
TW4	3.46	(87.9)
FV6	5.22	(132.6)
MV6	5.22	(132.6)
TW6	4.00	(101.6)

Flow Characteristics

AP2700

Inlet pressure: greater than 150 psig (1.0 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity Bulk gas delivery

Series AP9000 & 9100

- For UHP gas delivery
- Inlet pressure AP9000: Max. 1700 psig (11.7 MPa)
AP9100: Max. 800 psig (5.5 MPa)
- Flow capacity AP9000: to 2000 slpm
AP9100: to 5000 slpm
- Body material: 316L SS
- Tied-diaphragm design



RoHS

How to Order

AP9 0 10 S 2PW FV16 FV16

Size

Code	Cv
0	3
1	4

Delivery pressure

Code	Delivery pressure	Size
10	5 to 100 psig (0.034 to 0.7 MPa)	0 1
15	5 to 150 psig (0.034 to 1.0 MPa)	
30	Preset to 300 psig (2.1 MPa)	

Material

Code	Material
S	316L SS

Surface finish

Code	Surface finish Ra max
No code	15 μin. (0.4 μm)
M	10 μin. (0.25 μm)

Ports

Code	Ports
2PW	2 ports
3PW	3 ports

Connections (Inlet ①, Outlet ②)

Code	Connections
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
FV16	1 inch face seal (Female)
MV16	1 inch face seal (Male)
TW16	1 inch tube weld

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Gauge ports (Outlet ③)

Code	Pressure gauge *1)
No code	No gauge port
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
4	0 to 400 psig 0 to 3 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Porting Configuration

① IN ② OUT ③ Gauge port (Outlet)

Sample Order Number

Port	①	②	③
AP9010S	2PW	FV16	FV16
	3PW	FV16	FV16 H MPA

Specifications

Operating Parameters		AP9010	AP9030	AP9110	AP9115
Delivery pressure		5 to 100 psig (0.034 to 0.7 MPa)	Preset to 300 psig (2.1 MPa) *1)	5 to 100 psig (0.034 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa) (Source pressure 250 psig or less)*5)
Gas		Select compatible materials of construction for the gas			
Source pressure		Vacuum to 1700 psig (11.7 MPa)		Vacuum to 800 psig (5.5 MPa)	
Proof pressure (Inlet)		2550 psig (17.6 MPa)			
Burst pressure		6800 psig (46.9 MPa)			
Ambient and operating temperature		-40 to 71°C (No freezing) *2)			
Cv		3.0		4.0	
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m³/s			
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m³/s *3)			
Across the seat leak		4 x 10 ⁻⁹ Pa·m³/s *3)			
Surface finish		Ra max 15 µin (0.4 µm) or 10 µin (0.25 µm)			
Connections		Face seal, Tube weld			
Bonnet port		NPT 1/8 inch			
Supply pressure effect		3.7 psig (0.026 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop		5.4 psig (0.038 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop	
Internal volume		12 in³ (197 cm³)			
Weight		5.9 kg *4)			

*1) At 800 psig (5.5 MPa) inlet pressure. Optional preset pressure available. Please contact SMC.

*2) Max. 90°C for Polyimide seat.

*3) Tested with Helium gas inlet pressure 300 psig (2.1 MPa).

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

*5) Source pressure above 250 psig (1.7 MPa) decreases maximum delivery pressure to less than 150 psig (1 MPa) due to supply pressure effect. When the source pressure is 800 psig (5.5 MPa), achievable delivery pressure is around 119 psig (0.82 MPa).

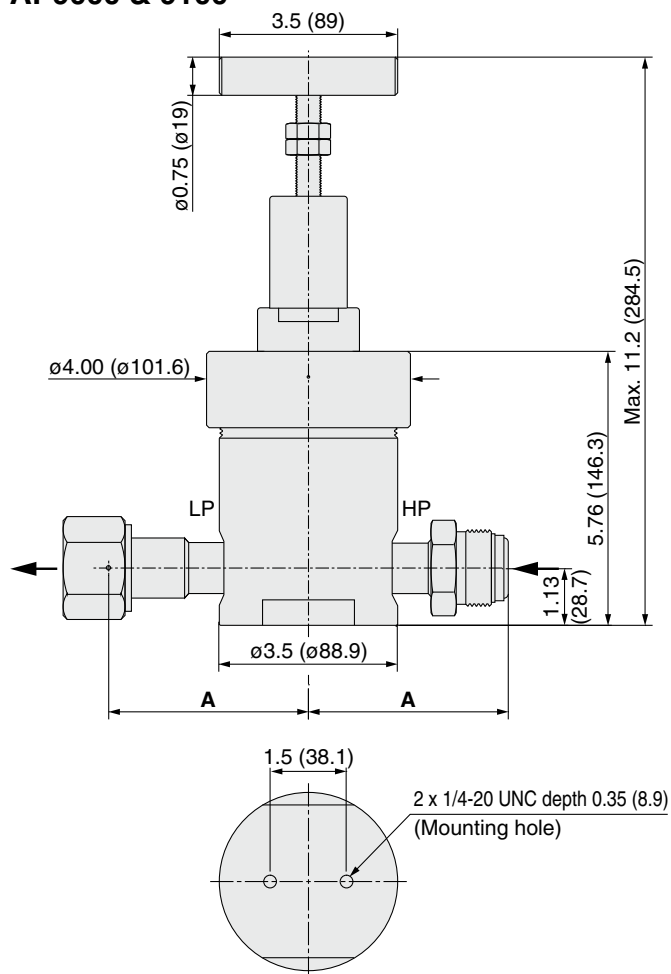
Wetted Parts Material

Wetted Parts	S
Body	316L SS
Surface finish	Electropolish + Passivation
Poppet	Ni-Cr-Mo alloy
Bellows	Ni-Cr-Mo alloy
Nozzle	316L SS
Seat	PCTFE (Option: Polyimide)
Poppet spring	Ni-Co alloy
Bonnet seal	Nickel 200 *) (Silver plated)

Dimensions

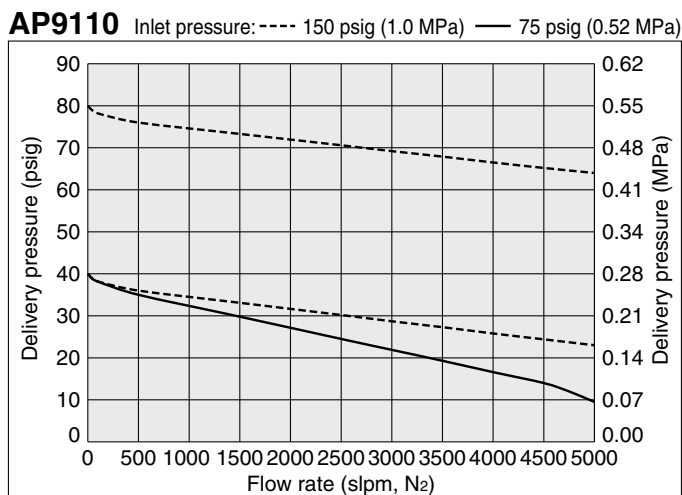
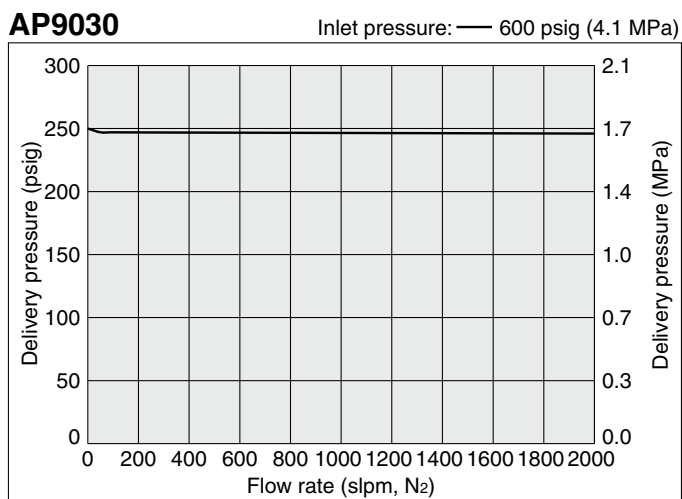
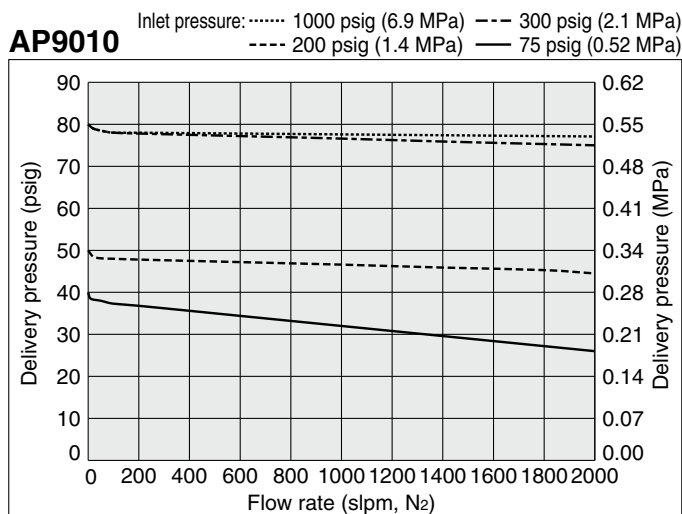
inch (mm)

AP9000 & 9100



Connections	A	
	inch	(mm)
FV8	3.11	(79.0)
MV8		
TW8	4.75	(120.7)
FV12	3.64	(92.5)
MV12		
TW12	4.75	(120.7)
FV16	3.92	(99.6)
MV16		
TW16	4.75	(120.7)

Flow Characteristics



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Compact Regulator for Ultra High Purity

Series SL5200

- For UHP gas delivery
- Flow capacity Standard: to 30 slpm
HF (option): to 130 slpm
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Sub-atmospheric pressure delivery option
- Springless design (No poppet spring in the wetted area)



RoHS

How to Order

SL52 02 S M 2PW FV4 FV4

Port Number
① ② ③

Delivery pressure

Code	Delivery pressure
01	0.5 to 10 psig (0.0034 to 0.07 MPa) Sub-atmospheric (A): 100 mm Hg absolute to 10 psig (-88 kPa to 0.07 MPa)
02	0.5 to 30 psig (0.0034 to 0.2 MPa)
06	1 to 60 psig (0.007 to 0.4 MPa)
10	1 to 100 psig (0.007 to 0.7 MPa)

Material

Code	Body	Poppet	Diaphragm
S	316L SS	316L SS	316L SS
SH	secondary remelt	Ni-Cr-Mo alloy	

Surface finish

Code	Surface finish Ra max
M	10 μin. (0.25 μm) Standard
V	7 μin. (0.18 μm)
X	5 μin. (0.13 μm)

Range options *1)

Code	Specification
No code	Standard
A	Sub-atmospheric

*1) Only available with SL5201.

Ports

Code	Ports
2PW	2 ports
3PW	3 ports

Connections (Inlet ①, Outlet ②)

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

Gauge port (Outlet ③)

Code	Connections or Pressure gauge *2)
No code	No gauge port
0	No pressure gauge 1/4 inch face seal (Male)
FV4	No pressure gauge 1/4 inch face seal (Female)
V3	With pressure gauge -30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	With pressure gauge -30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	With pressure gauge -30 in.Hg to 100 psig -0.1 to 0.7 MPa

*2) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Option

Code	Specification
No code	Standard
HF	High flow

Seat material

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

*4) Not available with SH material.

Pressure gauge unit *3)

Code	Unit
No code	psig/bar
MPA	MPa

*3) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration

① IN ② OUT ③ Gauge port(Outlet)

Specifications

Operating Parameters	SL5201□□A	SL5201	SL5202	SL5206	SL5210
Delivery pressure	100 mm Hg absolute to 10 psig (-88 kPa to 0.07 MPa)	0.5 to 10 psig (0.0034 to 0.07 MPa)	0.5 to 30 psig (0.0034 to 0.2 MPa)	1 to 60 psig (0.007 to 0.4 MPa)	1 to 100 psig (0.007 to 0.7 MPa)
Gas	Select compatible materials of construction for the gas				
Source pressure	Vacuum to 150 psig (1.0 MPa)				
Proof pressure (Inlet)	500 psig (3.4 MPa)				
Burst pressure	1000 psig (6.9 MPa)				
Ambient and operating temperature	-40 to 71°C (No freezing) *1)				
Cv	0.07				
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s			
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)			
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *2)			
Surface finish		Ra max 10 μin. (0.25 μm) Option: 7 μin. (0.18 μm), 5 μin. (0.13 μm)			
Connections		Face seal, Tube weld			
Supply pressure effect		0.20 psig (0.0014 MPa) rise in delivery pressure per 20 psig (0.14 MPa) source pressure drop			
Installation		Bottom mount			
Internal volume		0.19 in ³ (3.1 cm ³)			
Weight		0.45 kg *3)			

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 100 psig (0.7 MPa).

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

Option

High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	SL5201□□A	SL5201	SL5202	SL5206	SL5210
HF	Supply pressure effect	0.50 psig (0.0035 MPa) rise in delivery pressure per 20 psig (0.14 MPa) source pressure drop				

Single Stage Compact Regulator for Ultra High Purity **Series SL5200**

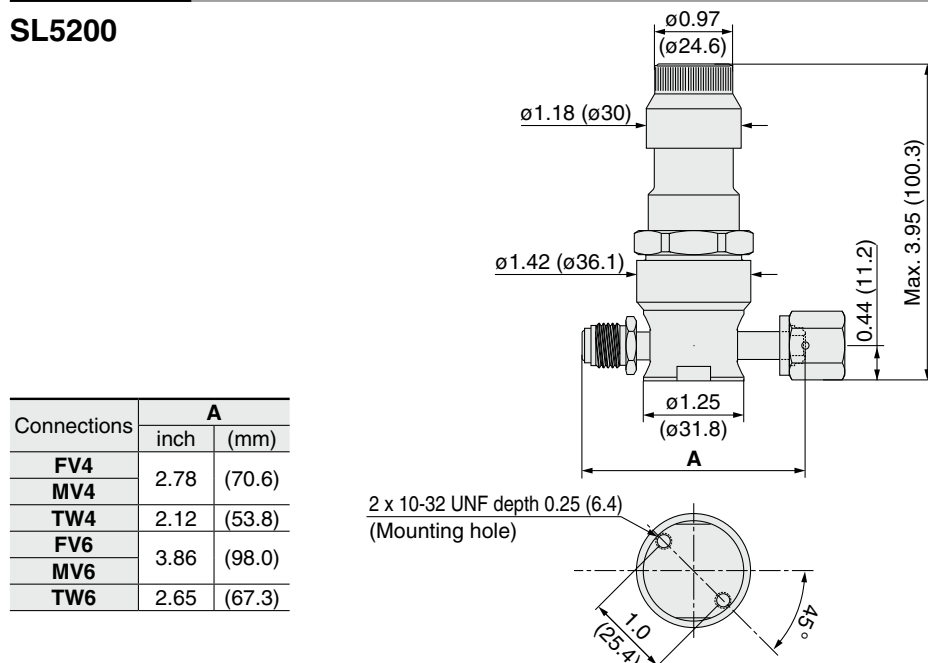
Wetted Parts Material

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

Dimensions

inch (mm)

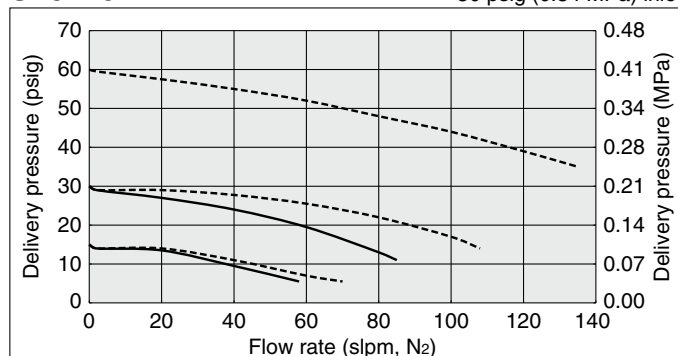
SL5200



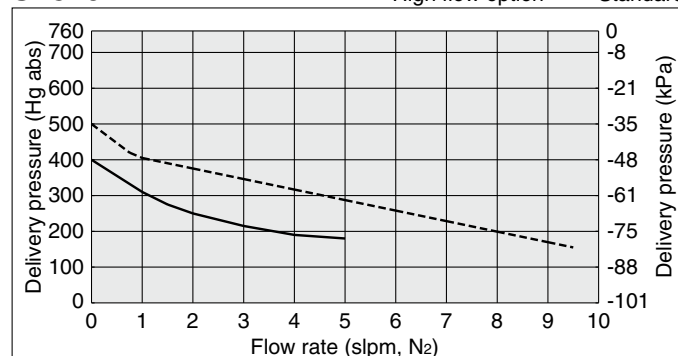
Connections	A	
	inch	(mm)
FV4	2.78	(70.6)
MV4	2.12	(53.8)
TW4	2.12	(53.8)
FV6	3.86	(98.0)
MV6	2.65	(67.3)
TW6	2.65	(67.3)

Flow Characteristics

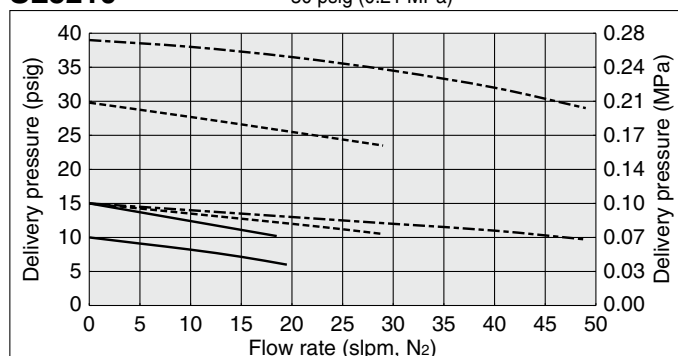
SL5210HF Inlet pressure: --- 100 psig (0.69 MPa) inlet
— 50 psig (0.34 MPa) inlet



SL5201A Inlet pressure: 2 psig (14 kPa)
---- High flow option — Standard



SL5210 Inlet pressure: --- 100 psig (0.69 MPa) --- 60 psig (0.41 MPa)
— 30 psig (0.21 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity Low flow

Series SL5500

- For UHP gas delivery
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity to 30 slpm
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Sub-atmospheric pressure delivery option
- Springless design (No poppet spring in the wetted area)



RoHS

How to Order

SL55 02 S M 2PW FV4 FV4

Port Number ① ② ③ ④

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa) Sub-atmospheric (A): 100 mm Hg absolute to 30 psig (-88 kPa to 0.2 MPa)
06	1 to 60 psig (0.007 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)

Material

Code	Body	Poppet	Diaphragm
S	316L SS	316L SS	316L SS
SH	secondary remelt	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy

Surface finish

Code	Surface finish Ra max
M	10 μin. (0.25 μm) Standard
V	7 μin. (0.18 μm)
X	5 μin. (0.13 μm)

Range options *1)

Code	Specification
No code	Standard
A	Sub-atmospheric

*1) Only available with SL5502.

Connections (Inlet ①, Outlet ②)

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

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *5)

*5) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *2)
No code	No gauge port
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	0 to 200 psig 0 to 1.4 MPa
40	0 to 4000 psig 0 to 28 MPa

*2) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Seat material

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

*4) Not available with SH material.

Pressure gauge unit *3)

Code	Unit
No code	psig/bar
MPA	MPa

*3) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

① IN ② OUT
③ Gauge port (Inlet)
④ Gauge port (Outlet)

Sample Order Number

Port		③	④
SL55	* * * *	2PW	* * *
		3PW	* * 0
		3PW	* * 1 MPA
		4PW	* * 0 0
		4PW	* * 40 1 MPA

Specifications

Operating Parameters		SL5502□□A	SL5502	SL5506	SL5510
Delivery pressure		100 mm Hg absolute to 30 psig (-88 kPa to 0.2 MPa)	1 to 30 psig (0.007 to 0.2 MPa)	1 to 60 psig (0.007 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)
Gas		Select compatible materials of construction for the gas			
Source pressure		Vacuum to 3500 psig (24.1 MPa)			
Proof pressure (Inlet)		5000 psig (34.5 MPa)			
Burst pressure		10000 psig (69 MPa)			
Ambient and operating temperature		-40 to 71°C (No freezing) *1)			
Cv		0.09			
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s			
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)			
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)			
Surface finish		Ra max 10 μin. (0.25 μm) Option: 7 μin. (0.18 μm), 5 μin. (0.13 μm)			
Bonnet port		NPT 1/8 inch *4)			
Supply pressure effect		0.25 psig (0.0017 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop			
Installation		Bottom mount (Option: panel mount)			
Internal volume		0.55 in ³ (9 cm ³)			
Weight		1.63 kg *5)			

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*3) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

*4) On panel mount option, bonnet port is not threaded.

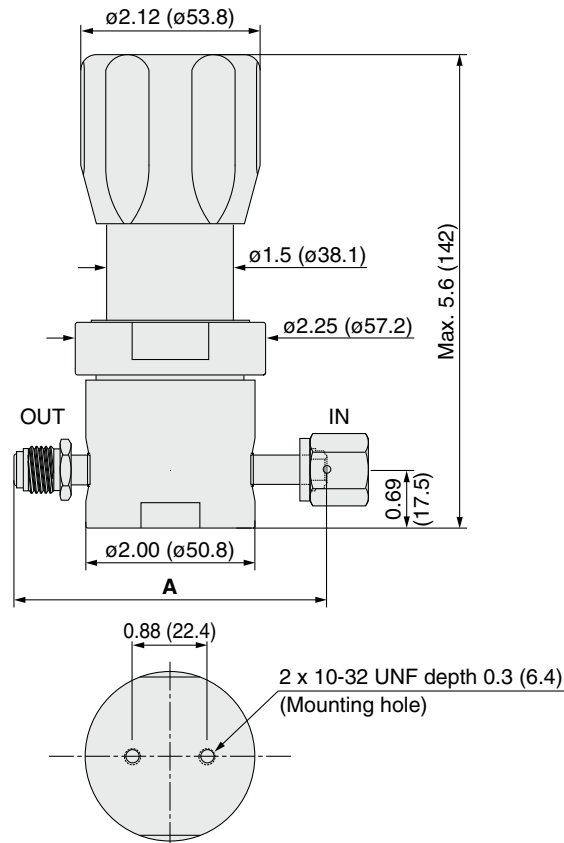
*5) Weight, including individual boxed weight, may vary depending on connections or options.

Wetted Parts Material

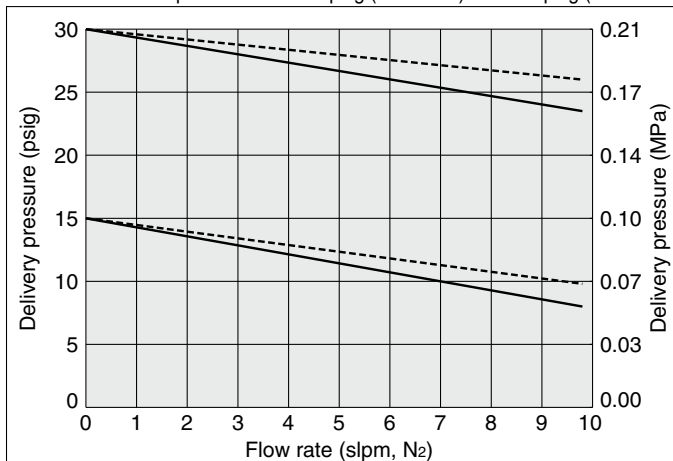
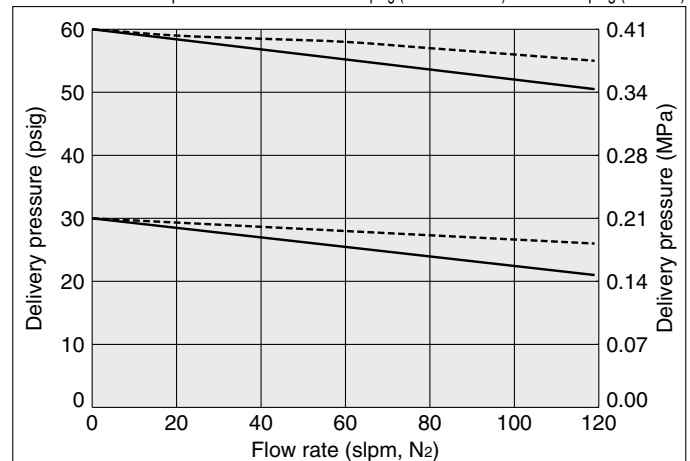
Wetted Parts	S	SH
Body	316L SS secondary remelt	
Surface finish	Electropolish + Passivation	
Poppet	316L SS	Ni-Cr-Mo alloy
Diaphragm	316L SS	Ni-Cr-Mo alloy
Nozzle	316L SS	Ni-Cr-Mo alloy
Seat	PCTFE (Option: Polyimide)	PCTFE

Dimensions

inch (mm)

SL5500

Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4	3.70	(94.0)
TW4	2.96	(75.2)
FV6	4.70	(119.4)
MV6	4.70	(119.4)
TW6	2.96	(75.2)

Flow Characteristics**SL5500** Inlet pressure: ---- 80 psig (0.55 MPa) — 50 psig (0.34 MPa)**SL5500** Inlet pressure: ---- 1000 to 3000 psig (6.9 to 20.7 MPa) — 500 psig (3.4 MPa)Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity Intermediate flow

Series SL5400

- For UHP gas delivery
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Springless design (No poppet spring in the wetted area)



RoHS

How to Order

SL54 02 S M 2PW FV4 FV4 [] [] [] [] []

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	1 to 60 psig (0.007 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)

Material

Code	Body	Poppet	Diaphragm
S	316L SS	316L SS	
SH	secondary remelt	Ni-Cr-Mo alloy	316L SS

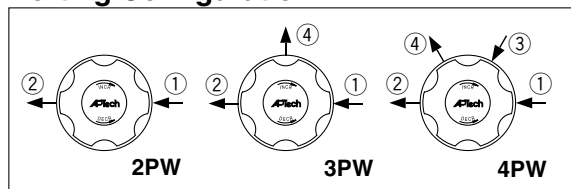
Surface finish

Code	Surface finish Ra max
M	10 μin. (0.25 μm) Standard
V	7 μin. (0.18 μm)
X	5 μin. (0.13 μm)

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

Porting Configuration



① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Connections (Inlet ①, Outlet ②)

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
FV8	1/2 inch face seal (Female)
MV8	1/2 inch face seal (Male)
TW8	1/2 inch tube weld

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *1)
	psig/bar unit MPa unit
No code	No gauge port
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
2	0 to 200 psig 0 to 1.4 MPa
10	0 to 1000 psig 0 to 7 MPa

*1) Other range available. Refer to gauge guide (P.115).

Select a pressure gauge, which has a larger pressure range than the delivery pressure of the regulator.

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *4)

*4) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Seat material

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

*3) Not available with SH material.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Sample Order Number

Port	③	④
SL54	2PW	0
	3PW	1
	4PW	0

Specifications

Operating Parameters		SL5402	SL5406	SL5410
Delivery pressure		1 to 30 psig (0.007 to 0.2 MPa)	1 to 60 psig (0.007 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)
Gas		Select compatible materials of construction for the gas		
Source pressure		Vacuum to 1000 psig (6.9 MPa)		
Proof pressure (Inlet)		3000 psig (20.7 MPa)		
Burst pressure		6000 psig (41.4 MPa)		
Ambient and operating temperature		-40 to 71°C (No freezing) *1)		
Cv		0.23		
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s		
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)		
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *2)		
Surface finish		Ra max 10 μin. (0.25 μm) Option: 7 μin. (0.18 μm), 5 μin. (0.13 μm)		
Connections		Face seal, Tube weld		
Bonnet port		NPT 1/8 inch *3)		
Supply pressure effect		1.6 psig (0.011 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop		
Installation		Bottom mount (Option: panel mount)		
Internal volume		1.2 in ³ (19.7 cm ³)		
Weight		1.91 kg *4)		

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

*3) On panel mount option, bonnet port is not threaded.

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

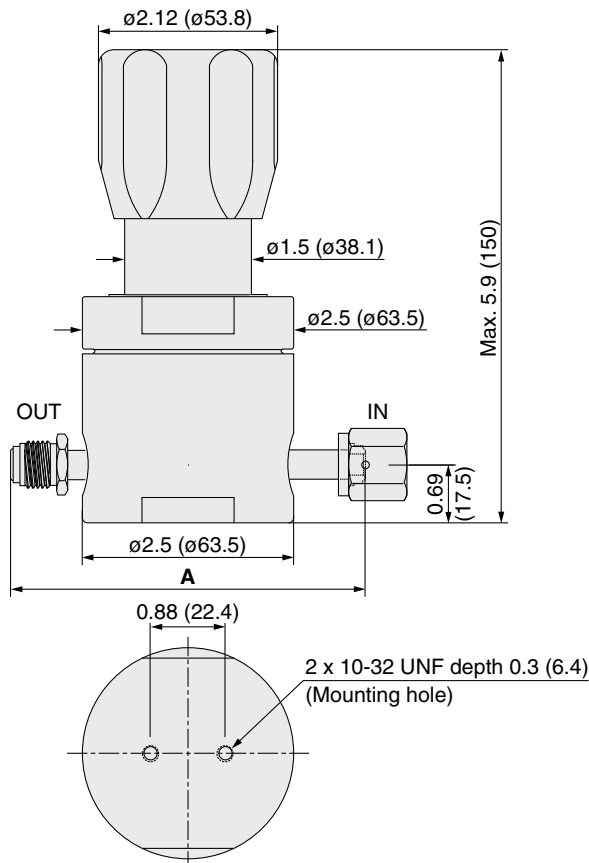
Wetted Parts Material

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

Dimensions

inch (mm)

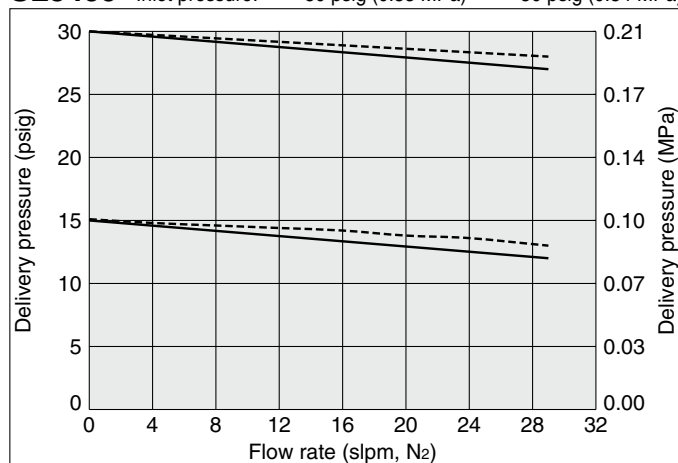
SL5400



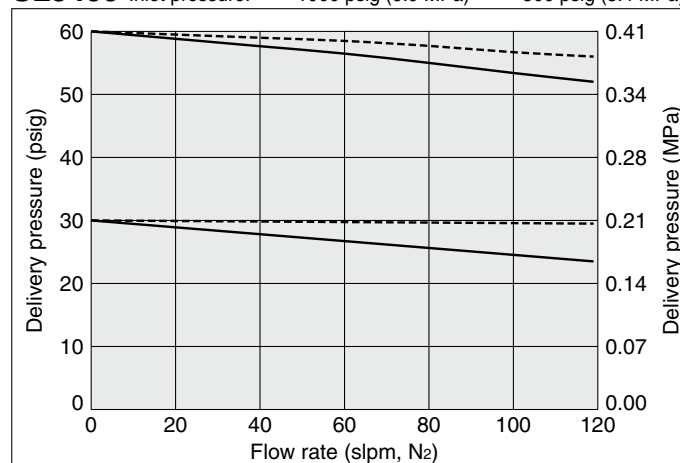
Connections	A	
	inch	(mm)
FV4	4.30	(109.2)
MV4	4.30	(109.2)
TW4	3.46	(87.9)
FV6	5.22	(132.6)
MV6	5.22	(132.6)
TW6	4.00	(101.6)
FV8	5.22	(132.6)
MV8	5.22	(132.6)
TW8	4.34	(110.2)

Flow Characteristics

SL5400 Inlet pressure: ---- 80 psig (0.55 MPa) — 50 psig (0.34 MPa)



SL5400 Inlet pressure: ---- 1000 psig (6.9 MPa) — 500 psig (3.4 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity Intermediate flow

Series SL5800

- For UHP gas delivery
- Inlet pressure: Max. 300 psig (2.1 MPa)
- Flow capacity to 200 slpm
- Body material: 316L SS secondary remelt
- Springless design (No poppet spring in the wetted area)



RoHS

How to Order

SL58 02 S M 2PW FV4 FV4

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	1 to 60 psig (0.007 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)

Material

Code	Body	Poppet	Diaphragm
S	316L SS secondary remelt	316L SS	316L SS

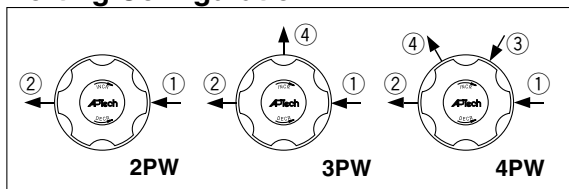
Surface finish

Code	Surface finish Ra max
M	10 μin. (0.25 μm) Standard
V	7 μin. (0.18 μm)
X	5 μin. (0.13 μm)

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

Porting Configuration



① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Connections (Inlet①, Outlet②)

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
FV8	1/2 inch face seal (Female)
MV8	1/2 inch face seal (Male)
TW8	1/2 inch tube weld

Gauge port (Inlet③, Outlet④)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch face seal male)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
2	0 to 200 psig	0 to 1.4 MPa
4	0 to 400 psig	0 to 3 MPa

*1) Other range available. Refer to gauge guide (P.115).

Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *3)

*3) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japan's regulation, only MPa is available in Japan.

Sample Order Number

Port	③	④
SL58	*	*
	2PW	*
	3PW	*
	3PW	1
	4PW	0

Specifications

Operating Parameters		SL5802	SL5806	SL5810
Delivery pressure		1 to 30 psig (0.007 to 0.2 MPa)	1 to 60 psig (0.007 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)
Gas		Select compatible materials of construction for the gas		
Source pressure		Vacuum to 300 psig (2.1 MPa)		
Proof pressure (Inlet)		2000 psig (13.8 MPa)		
Burst pressure		4000 psig (27.6 MPa)		
Ambient and operating temperature		-40 to 71°C (No freezing) *1)		
Cv		0.4		
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s		
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)		
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)		
Surface finish		Ra max 10 μin. (0.25 μm) Option: 7 μin. (0.18 μm), 5 μin. (0.13 μm)		
Connections		Face seal, Tube weld		
Bonnet port		NPT 1/8 inch *4)		
Supply pressure effect		5 psig (0.035 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop		
Installation		Bottom mount (Option: panel mount)		
Internal volume		1.2 in ³ (19.7 cm ³)		
Weight		1.91 kg *5)		

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 300 psig (2.1 MPa).

*3) Tested with Helium gas inlet pressure 100 psig (0.7 MPa).

*4) On panel mount option, bonnet port is not threaded.

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

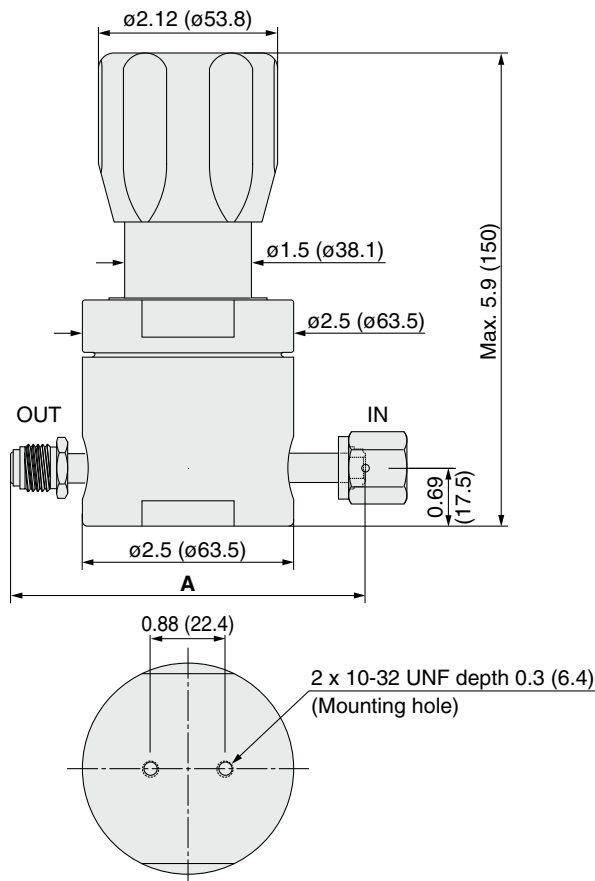
Wetted Parts Material

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

Dimensions

inch (mm)

SL5800

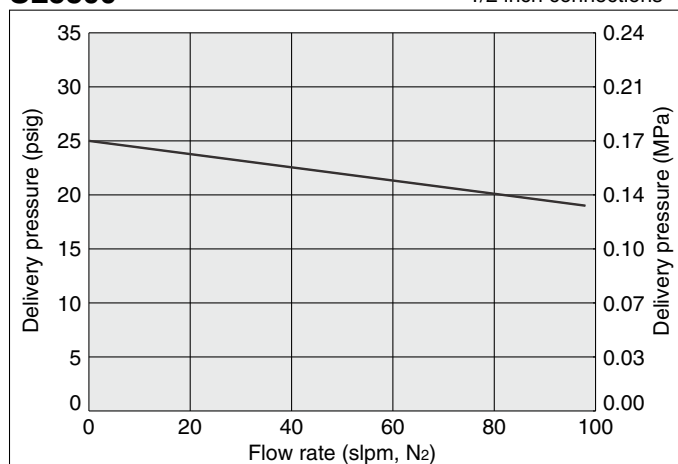


Connections	A	
	inch	(mm)
FV4	4.30	(109.2)
MV4	4.30	(109.2)
TW4	3.46	(87.9)
FV6	5.22	(132.6)
MV6	5.22	(132.6)
TW6	4.00	(101.6)
FV8	5.22	(132.6)
MV8	5.22	(132.6)
TW8	4.34	(110.2)

Flow Characteristics

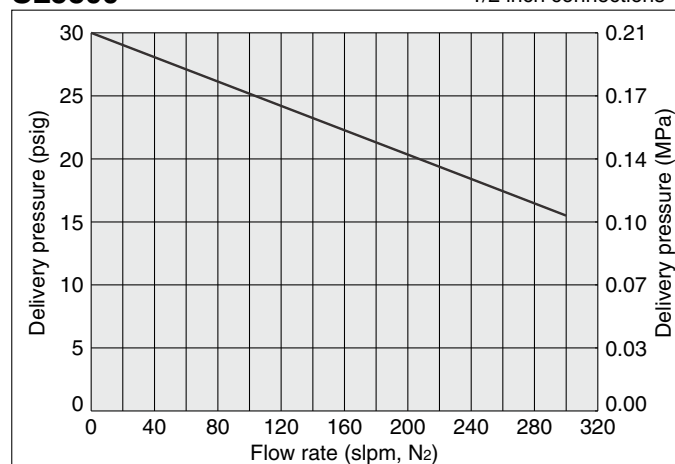
SL5800

Inlet pressure: 30 psig (0.21 MPa)
1/2 inch connections *



SL5800

Inlet pressure: 100 psig (0.69 MPa)
1/2 inch connections *



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity

Low to intermediate flow

Series AZ1000

- For UHP gas delivery
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity Standard: to 30 slpm
HF (option): to 120 slpm
- Body material: 316L SS
- Ni-Cr-Mo alloy internals available for corrosion resistance



RoHS

How to Order

AZ10 01 S 2PW FV4 FV4

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
01	1 to 10 psig (0.007 to 0.07 MPa)
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SHP	316L SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	316L SS

Surface finish

Code	Surface finish Ra
No code	10 μin. (0.25 μm) Standard
Q	25 μin. (0.62 μm)

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

Connections (Inlet ①, Outlet ②)

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

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *1
	psig/bar unit MPa unit
No code	No gauge port
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	0 to 200 psig 0 to 1.4 MPa
4	0 to 400 psig 0 to 3 MPa
40	0 to 4000 psig 0 to 28 MPa

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *6)
BP	Bonnet port (NPT 1/8 inch)

*6) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Option

Code	Specification
No code	Standard (Cv: 0.09)
HF	High flow (Cv: 0.15)

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide *3)
TF	PTFE *4) *5)

*3) Not available with SHP material.
*4) PTFE recommended for applications such as within a process tool.
*5) Source pressure rating is limited to 300 psig (2.1 MPa) or less.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Sample Order Number

Port	①	②	③	④
AZ1001S	2PW	FV4	FV4	
	3PW	FV4	FV4	V3 MPa
	4PW	FV4	FV4	1 V3 MPa
	4PW	FV4	FV4	0 0

Specifications

Operating Parameters		AZ1001	AZ1002	AZ1006	AZ1010	AZ1015
Delivery pressure		1 to 10 psig (0.007 to 0.07 MPa)	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas				
Source pressure		Vacuum to 300 psig (2.1 MPa)	Vacuum to 3500 psig (24.1 MPa) *1)			
Proof pressure (Inlet)		5000 psig (34.5 MPa)				
Burst pressure		10000 psig (69 MPa)				
Ambient and operating temperature		-40 to 71°C (No freezing) *2)				
Cv		0.09				
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m³/s				
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m³/s *3)				
Across the seat leak		4 x 10 ⁻⁹ Pa·m³/s *4)				
Surface finish		Ra 10 μin. (0.25 μm) Option: 25 μin. (0.62 μm)				
Connections		Face seal, Tube weld				
Supply pressure effect		0.38 psig (0.0026 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				
Installation		Bottom mount (Option: panel mount)				
Internal volume		0.49 in³ (8 cm³)				
Weight		1.25 kg *5)				

*1) Max. 300 psig (2.1 MPa) for PTFE seat.

*2) Max. 90°C for Polyimide seat.

*3) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*4) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

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

Option

High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AZ1001	AZ1002	AZ1006	AZ1010	AZ1015
HF	Cv			0.15		
	Supply pressure effect	0.75 psig (0.0052 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				

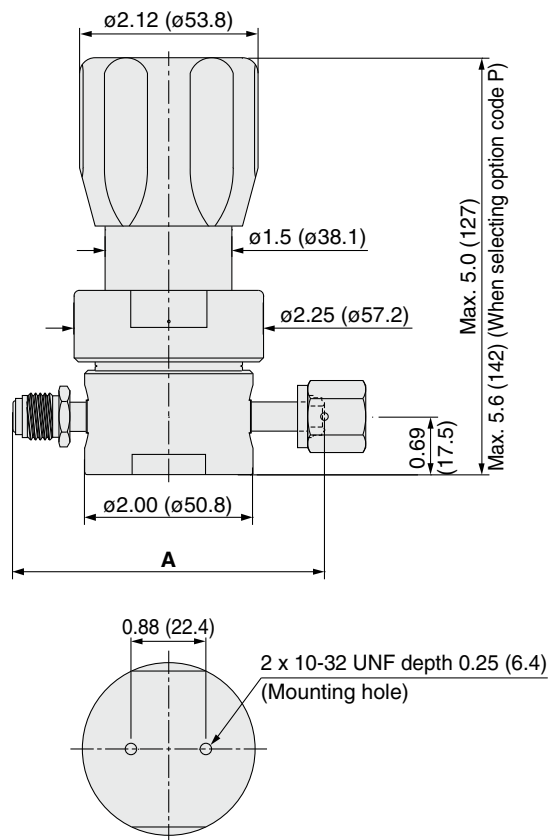
Wetted Parts Material

Wetted Parts	S	SHP
Body	316L SS	
Surface finish	Electropolish + Passivation	
Poppet	316L SS	Ni-Cr-Mo alloy
Diaphragm	316L SS	Ni-Cr-Mo alloy
Nozzle	316L SS	
Seat	PCTFE (Option: Polyimide, PTFE)	PCTFE (Option: PTFE)

Dimensions

inch (mm)

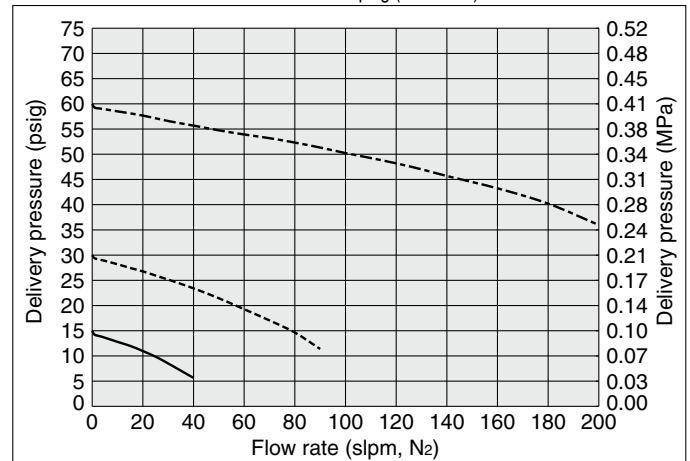
AZ1000



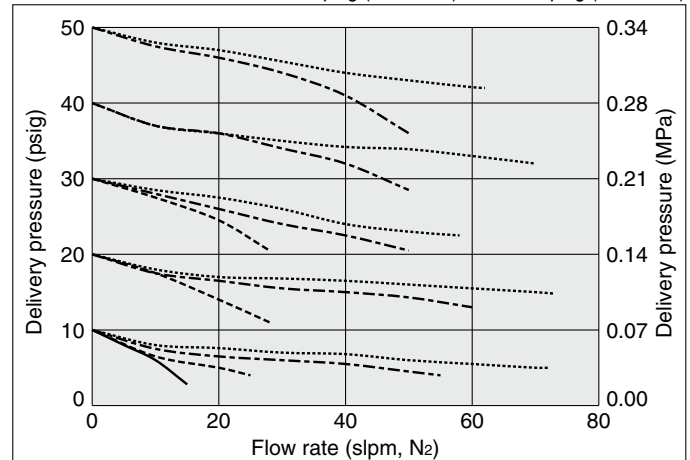
Connections	A	
	inch	(mm)
FV4 MV4	3.70	(94.0)
FV6 MV6	4.70	(119.4)
TW6	2.96	(75.2)

Flow Characteristics

AZ1000HF Inlet pressure: --- 100 psig (0.69 MPa) ---- 50 psig (0.34 MPa)
— 30 psig (0.21 MPa)



AZ1000 Inlet pressure: 100 psig (0.69 MPa) --- 80 psig (0.55 MPa)
---- 40 psig (0.28 MPa) — 20 psig (0.14 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity

Low flow
(Tied-diaphragm)

Series AZ1500

- For UHP gas delivery
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Body material: 316L SS
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Tied-diaphragm design



RoHS

How to Order

AZ15 02 S 2PW FV4 FV4

Port Number

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SHP	316L SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	316L SS

Surface finish

Code	Surface finish Ra
No code	10 μin. (0.25 μm) Standard
Q	25 μin. (0.62 μm)

Connections (Inlet ①, Outlet ②)

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

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *4)
BP	Bonnet port (NPT 1/8 inch)

*4) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Seat material

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

*3) Not available with SHP material.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

Porting Configuration

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *1)
No code	No pressure gauge
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	0 to 200 psig 0 to 1.4 MPa
40	0 to 4000 psig 0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Sample Order Number

Port	①	②	③	④
AZ1510S	2PW	FV4	FV4	
	3PW	FV4	FV4	0
	3PW	FV4	FV4	1 MPA
	4PW	FV4	FV4	40 1 MPA
	4PW	FV4	FV4	0 0

Specifications

Operating Parameters		AZ1502	AZ1506	AZ1510	AZ1515
Delivery pressure		1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas			
Source pressure		Vacuum to 3500 psig (24.1 MPa)			
Proof pressure (Inlet)		5000 psig (34.5 MPa)			
Burst pressure		10000 psig (69 MPa)			
Ambient and operating temperature		-40 to 71°C (No freezing) *1)			
Cv		0.09			
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s			
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)			
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)			
Surface finish		Ra 10 μin.(0.25 μm) Option: 25 μin.(0.62 μm)			
Connections		Face seal, Tube weld			
Supply pressure effect		0.41 psig (0.0028 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop			
Installation		Bottom mount (Option: panel mount)			
Internal volume		0.51 in ³ (8.4 cm ³)			
Weight		1.27 kg *4)			

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*3) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

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

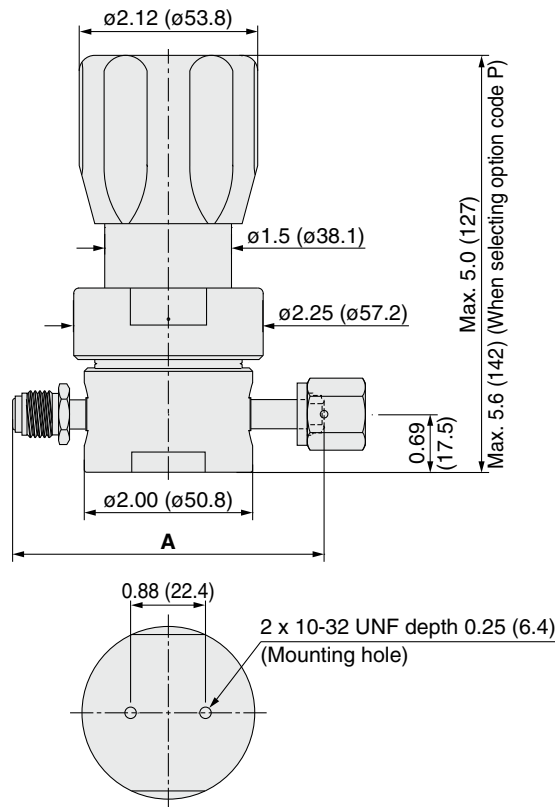
Wetted Parts Material

Wetted Parts	S	SHP
Body	316L SS	
Surface finish	Electropolish + Passivation	
Poppet	316L SS	Ni-Cr-Mo alloy
Diaphragm	316L SS	Ni-Cr-Mo alloy
Nozzle	316L SS	
Seat	PCTFE (Option: Polyimide)	PCTFE

Dimensions

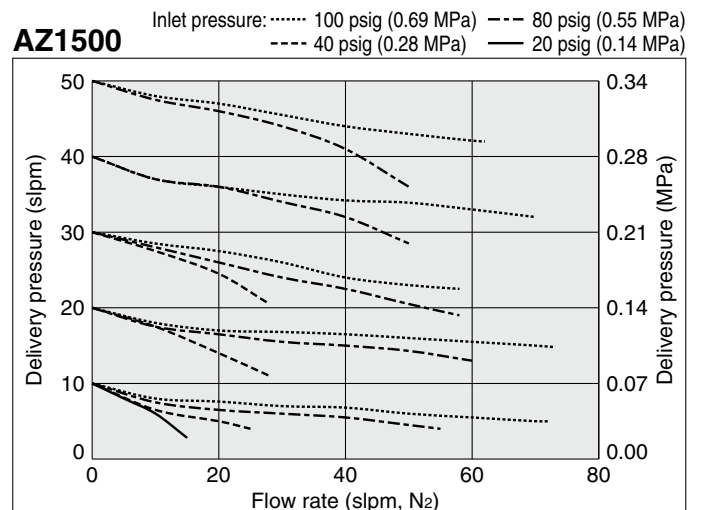
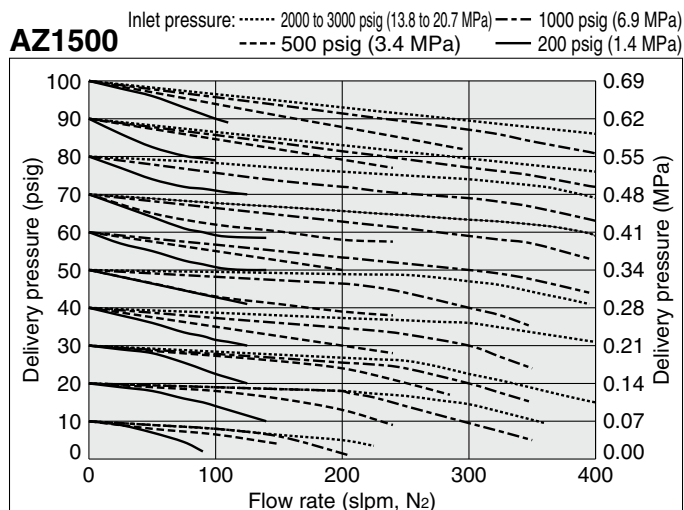
inch (mm)

AZ1500



Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4		
FV6	4.70	(119.4)
MV6		
TW6	2.96	(75.2)

Flow Characteristics



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity

Intermediate flow
(Tied-diaphragm)

Series AZ1400T

- For UHP gas delivery
- High inlet pressure type Standard: Max. 2300 psig (15.9 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity to 400 slpm
- Body material: 316L SS
- Ni-Cr-Mo alloy internals standard
- Sub-atmospheric pressure delivery option
- Tied-diaphragm design



RoHS

How to Order

AZ14 02 T S 2PW FV4 FV4

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa) Sub-atmospheric (A): 100 mm Hg absolute to 30 psig (-88 kPa to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm
S	316L SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy

Surface finish

Code	Surface finish Ra
No code	10 μin. (0.25 μm) Standard
Q	25 μin. (0.62 μm)

Range options *1)

Code	Specification
No code	Standard
A	Sub-atmospheric

*1) Only available with AZ1402T.

Connections (Inlet ①, Outlet ②)

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

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *2)
No code	No pressure gauge
0	No gauge port
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	0 to 200 psig 0 to 1.4 MPa
4	0 to 400 psig 0 to 3 MPa
40	0 to 4000 psig 0 to 28 MPa

*2) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation*5)
BP	Bonnet port (1/8 inch)

*5) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Option

Code	Specification
No code	Standard
HR	High inlet pressure (Max. inlet pressure 3000 psig (20.7 MPa)) *4)

*4) Not available with AZ1402T and AZ1406T.

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide

Pressure gauge unit *3)

Code	Unit
No code	psig/bar
MPA	MPa

*3) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

① IN
② OUT
③ Gauge port (Inlet)
④ Gauge port (Outlet)

Specifications

Operating Parameters		AZ1402T□□A	AZ1402T	AZ1406T	AZ1410T	AZ1415T
Delivery pressure		100 mm Hg absolute to 30 psig (-88 kPa to 0.2 MPa)	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa) (Source pressure 1000 psig or less) *1)
Gas		Select compatible materials of construction for the gas				
Source pressure		Vacuum to 300 psig (2.1 MPa)	Vacuum to 2300 psig (15.9 MPa)			
Proof pressure (Inlet)		4000 psig (27.6 MPa)				
Burst pressure		8000 psig (55.2 MPa)				
Ambient and operating temperature		-40 to 71°C (No freezing) *2)				
Cv		0.45				
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m³/s				
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m³/s *3)				
Across the seat leak		4 x 10 ⁻⁹ Pa·m³/s *4)				
Surface finish		Ra 10 μin. (0.25 μm) Option: 25 μin. (0.62 μm)				
Connection		Face seal, Tube weld				
Supply pressure effect		1.6 psig (0.011 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				
Installation		Bottom mount (Option: panel mount)				
Internal volume		1.06 in³ (17.4 cm³)				
Weight		2.04 kg *5)				

*1) Source pressure above 1000 psig (6.9 MPa) decreases maximum delivery pressure to less than 150 psig (1 MPa) due to supply pressure effect. When the source pressure is 2300 psig (15.9 MPa), achievable delivery pressure is around 129 psig (0.89 MPa).

*2) Max. 90°C for Polyimide seat.

*3) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*4) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

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

Single Stage Regulator for Ultra High Purity *Series AZ1400T*

Intermediate flow (Tied-diaphragm)

Option

High inlet pressure

Changes from the standard type are:

Option	Other Parameters	AZ1410T	AZ1415T
HR	Source pressure	Vacuum to 3000 psig (20.7 MPa)	
	Proof pressure (Inlet)	4500 psig (31 MPa)	
	Burst pressure	9000 psig (62 MPa)	

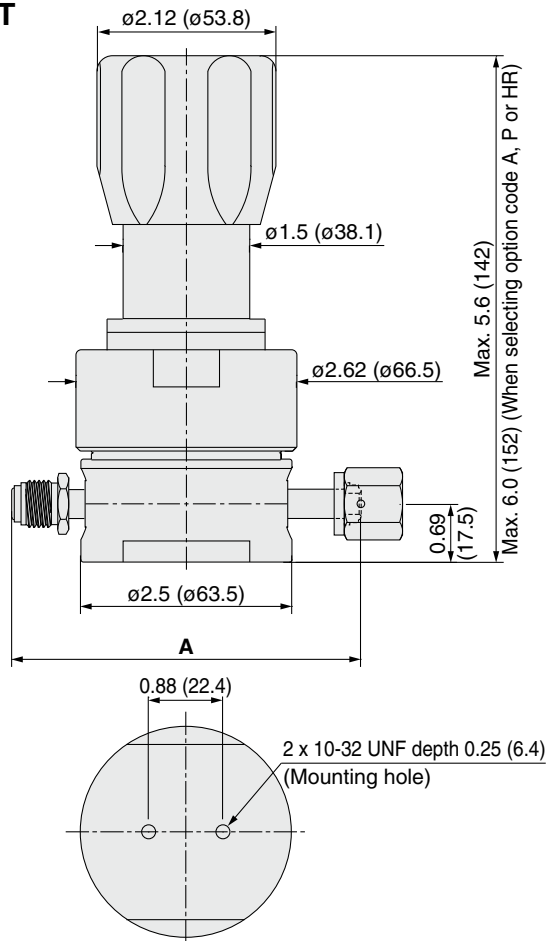
Wetted Parts Material

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

Dimensions

inch (mm)

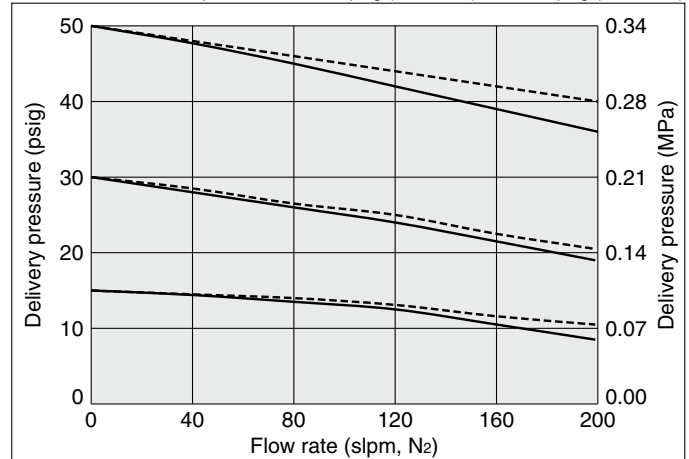
AZ1400T



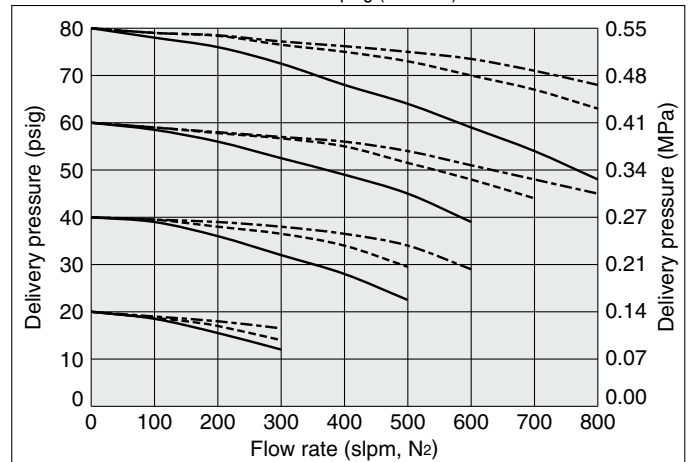
Connections	A	
	inch	(mm)
FV4	4.30	(109.2)
MV4	4.30	(109.2)
FV6	5.22	(132.6)
MV6	5.22	(132.6)
TW6	4.00	(101.6)
FV8	5.22	(132.6)
MV8	5.22	(132.6)
TW8	4.34	(110.2)

Flow Characteristics

AZ1400T Inlet pressure: ---- 80 psig (0.55 MPa) — 60 psig (0.41 MPa)

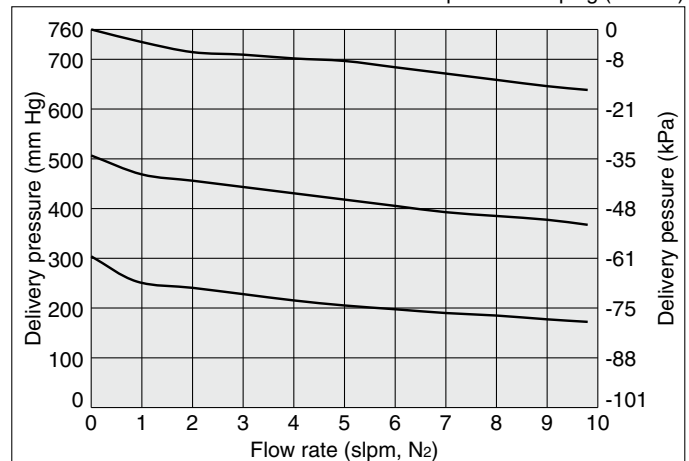


AZ1400T Inlet pressure: --- 2000 psig (13.8 MPa) --- 600 psig (4.1 MPa) — 200 psig (1.4 MPa)



AZ1402TA

Inlet pressure: 2 psig (14 kPa)



Note) slpm N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity High flow

Series AZ1300

- For UHP gas delivery
- Flow capacity to 1000 slpm
- Body material: 316L SS
- Inlet pressure: Max. 300 psig (2.1 MPa)



RoHS

How to Order

AZ13 **02** **S** **2PW** **FV8** **FV8**

Port Number ① ② ③

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm
S	316L SS	316L SS	Ni-Cr-Mo alloy

Surface finish

Code	Surface finish Ra
No code	10 μin. (0.25 μm) Standard
Q	25 μin. (0.62 μm)

Ports

Code	Ports
2PW	2 ports
3PW	3 ports

Connections (Inlet ①, Outlet ②)

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

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation*4)
BP	Bonnet port (NPT 1/8 inch)

*4) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Seat material

Code	Material
No code	PCTFE (Standard)
TF	PTFE *3)

*3) PTFE recommended for applications such as within a process tool.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Gauge port (Inlet ③)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch face seal male)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
2	0 to 200 psig	0 to 1.4 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Porting Configuration

① IN ② OUT ③ Gauge port (Outlet)

Sample Order Number

Port	①	②	③
AZ1302S	2PW	FV8	FV8
	3PW	FV8	FV8
	3PW	FV8	V3

Specifications

Operating Parameters		AZ1302	AZ1306	AZ1310	AZ1315
Delivery pressure		1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas			
Source pressure		Vacuum to 300 psig (2.1 MPa)			
Proof pressure (Inlet)		450 psig (3.1 MPa)			
Burst pressure		1200 psig (8.3 MPa)			
Ambient and operating temperature		-40 to 71°C (No freezing)			
Cv		1.1			
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s			
	Outboard leakage	1 x 10 ⁻¹⁰ Pa·m ³ /s *1)			
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s			
Surface finish		Ra 10 μin. (0.25 μm) Option: 25 μin. (0.62 μm)			
Connections		Face seal, Tube weld			
Supply pressure effect		4.6 psig (0.031 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop			
Installation		Bottom mount (Option: panel mount)			
Internal volume		1.19 in ³ (19.6 cm ³)			
Weight		2.0 kg *2)			

*1) Tested with Helium gas inlet pressure 300 psig (2.1 MPa).

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

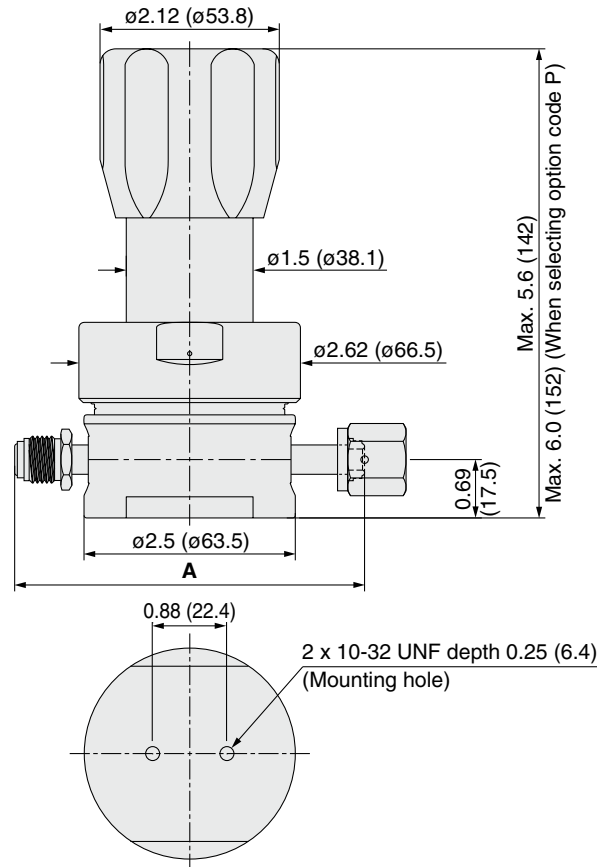
Wetted Parts Material

Wetted Parts	S
Body	316L SS
Surface finish	Electropolish + Passivation
Nozzle	316L SS
Poppet	316L SS
Diaphragm	Ni-Cr-Mo alloy
Seat	PCTFE (Option: PTFE)

Dimensions

inch (mm)

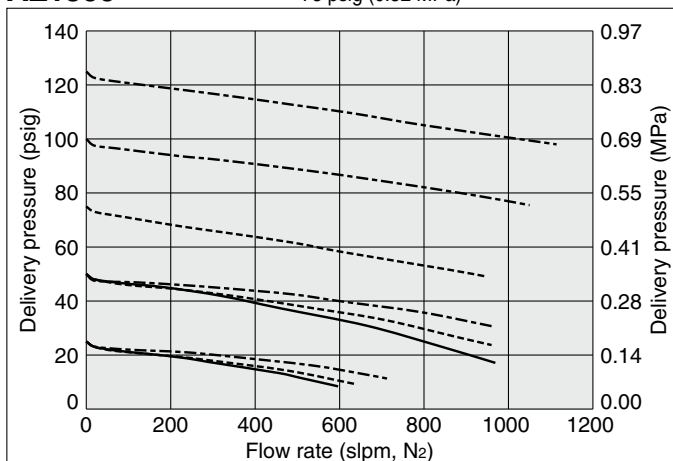
AZ1300



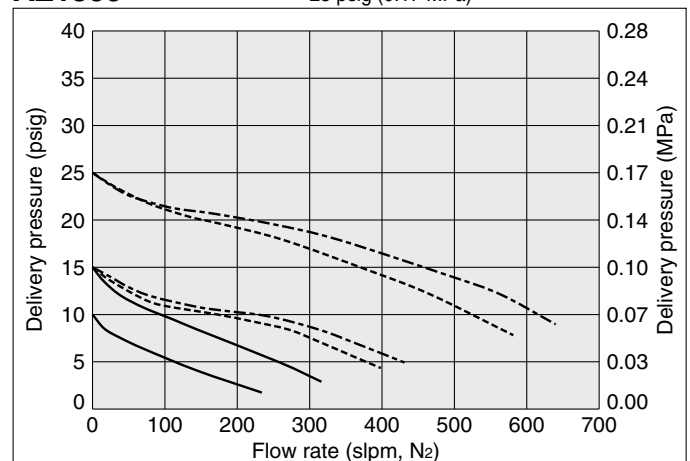
Connections	A	
	inch	(mm)
FV4	4.30	(109.2)
MV4	4.30	(109.2)
FV6	5.22	(132.6)
MV6	5.22	(132.6)
TW6	4.00	(101.6)
FV8	5.22	(132.6)
MV8	5.22	(132.6)
TW8	4.34	(110.2)

Flow Characteristics

AZ1300 Inlet pressure: --- 150 psig (1.0 MPa) ---- 100 psig (0.69 MPa)
— 75 psig (0.52 MPa)



AZ1300 Inlet pressure: --- 75 psig (0.52 MPa) ---- 50 psig (0.34 MPa)
— 25 psig (0.17 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity

High flow
(Tied-diaphragm)

Series AZ1200

- For UHP gas delivery
- High inlet pressure type Standard: Max. 1700 psig (11.7 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity Standard to 800 slpm
HF (option): to 1000 slpm
FC (option): to 1500 slpm

- Body material: 316L SS
- Ni-Cr-Mo alloy internals available for corrosion resistance



RoHS

How to Order

AZ12 **02** **S** **2PW** **FV8** **FV8**

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)
25	Preset to 250 psig (1.7 MPa (Preset))

Material

Code	Body	Poppet	Diaphragm
S	316L SS	316L SS	Ni-Cr-Mo alloy
SHP		Ni-Cr-Mo alloy	

Surface finish

Code	Surface finish Ra
No code	10 μin. (0.25 μm) Standard
Q	25 μin. (0.62 μm)

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

Connections (Inlet^①, Outlet^②)

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

Gauge port (Inlet^③, Outlet^④)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch face seal male)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
2	0 to 200 psig	0 to 1.4 MPa
4	0 to 400 psig	0 to 3 MPa
40	0 to 4000 psig	0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation*6)
BP	Bonnet port (NPT 1/8 inch)

*6) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Option

Code	Specification
No code	Standard (Cv: 0.65)
HF	High flow (Cv: 1.1)
FC	Force compensation (Cv: 0.65) *4)*5)
HR	High inlet pressure (Max. inlet pressure 3000 psig (20.7 MPa)) *4)

*4) FC and HR options are not available with AZ1202, AZ1206 and AZ1225.

*5) FC option is available with 1/2 inch face seal or 1/2 inch tube weld.

Seat material

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

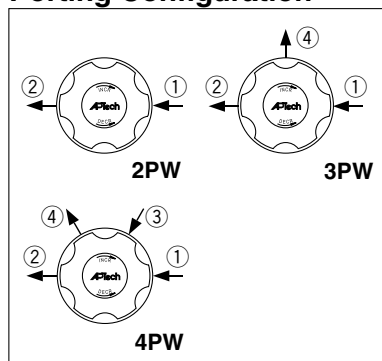
*3) Not available with SHP material.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration



- ① IN ② OUT ③ Gauge port (Inlet)
④ Gauge port (Outlet)

Sample Order Number

Port	①	②	③	④
AZ1210S	2PW	FV8	FV8	
	3PW	FV8	FV8	0
	3PW	FV8	FV8	1 MPA
	4PW	FV8	FV8	40 1 MPA

Specifications

Operating Parameters		AZ1202	AZ1206	AZ1210	AZ1215	AZ1225
Delivery pressure		1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa) (Source pressure 1000 psig or less) *1)	Preset to 250 psig (1.7 MPa) *2)
Gas		Select compatible materials of construction for the gas				
Source pressure		Vacuum to 1700 psig (11.7 MPa)				
Proof pressure (Inlet)		2550 psig (17.6 MPa)				
Burst pressure		8000 psig (55.2 MPa)				
Ambient and operating temperature		-40 to 71°C (No freezing) *3)				
Cv		0.65				
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m³/s				
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m³/s *4)				
Across the seat leak		4 x 10 ⁻⁹ Pa·m³/s *5)				
Surface finish		Ra 10 μin.(0.25 μm) Option: 25 μin.(0.62 μm)				
Connections		Face seal, Tube weld				
Supply pressure effect		3.5 psig (0.024 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				
Installation		Bottom mount (Option: panel mount)				
Internal volume		1.07 in³ (17.6 cm³)				
Weight		2.0 kg *6)				

*1) Source pressure above 1000 psig (6.9 MPa) decreases maximum delivery pressure to less than 150 psig (1 MPa) due to supply pressure effect. When the source pressure is 1700 psig (11.7 MPa), achievable delivery pressure is around 125 psig (0.86 MPa) (HF and FC option 120 psig (0.83 MPa)).

*2) 250 psig outlet pressure preset at 800 psig (5.5 MPa) inlet pressure. Custom inlet/outlet pressure settings available. Please contact SMC.

*3) Max. 90°C for Polyimide seat.

*4) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*5) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

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

Options

1. High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AZ1202	AZ1206	AZ1210	AZ1215	AZ1225
	Cv			1.1		
HF	Supply pressure effect	4.2 psig (0.029 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				

2. Force compensation

Force compensation feature added to HF option and has wider flow capacity than HF option.

Changes from the standard type are:

Option	Other Parameters	AZ1210	AZ1215
	Source pressure	Vacuum to 300 psig (2.1 MPa)	
	Cv	0.65	
FC	Supply pressure effect	4.2 psig (0.029 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop	
	Connections	1/2 inch face seal 1/2 inch tube weld	

3. High inlet pressure

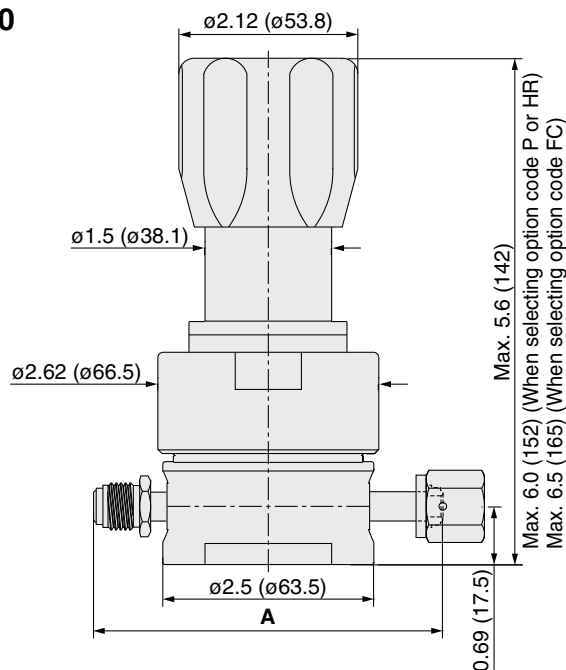
Changes from the standard type are:

Option	Other Parameters	AZ1210	AZ1215
	Source pressure	Vacuum to 3000 psig (20.7 MPa)	
HR	Proof pressure (Inlet)	4500 psig (31 MPa)	
	Burst pressure	9000 psig (62 MPa)	

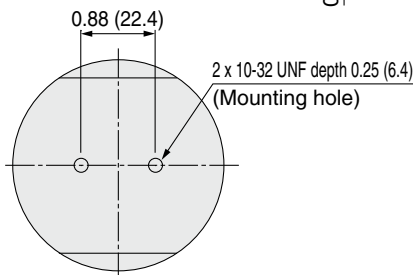
Dimensions

inch (mm)

AZ1200



Connections	A	
	inch	(mm)
FV4	4.30	(109.2)
MV4		
FV6	5.22	(132.6)
MV6		
TW6	4.00	(101.6)
FV8		
MV8	5.22	(132.6)
TW8		
	4.34	(110.2)

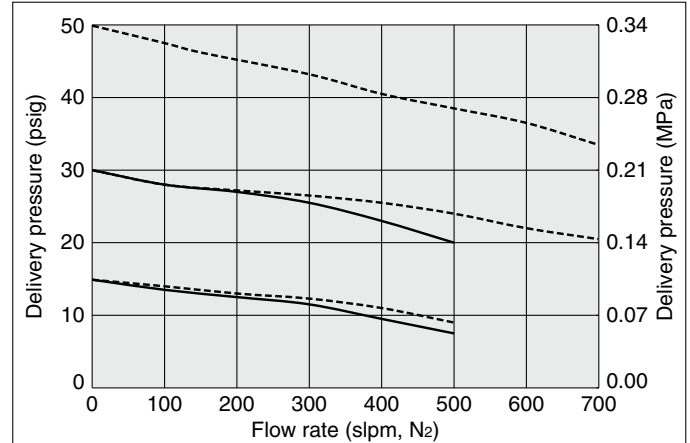


Wetted Parts Material

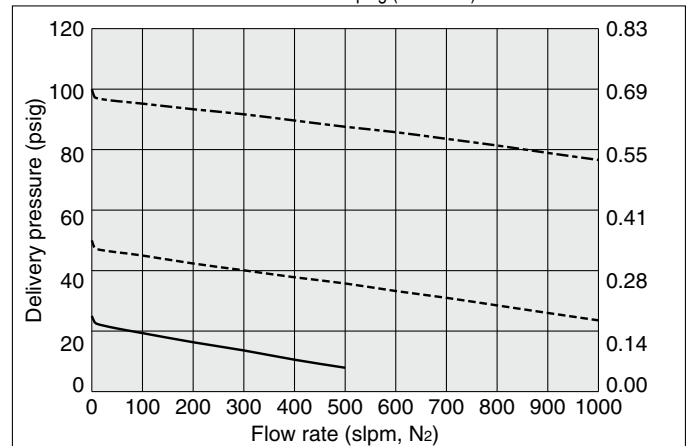
Wetted Parts	S	SH
Body	316L SS	
Surface finish	Electropolish + Passivation	
Poppet	316L SS	Ni-Cr-Mo alloy
Diaphragm	Ni-Cr-Mo alloy	
Nozzle	316L SS	
Seat	PCTFE (Option: Polyimide)	PCTFE

Flow Characteristics

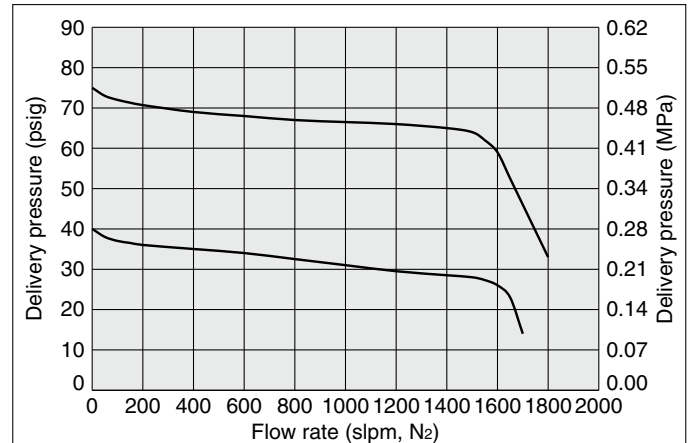
AZ1200 Inlet pressure: ---- 80 psig (0.55 MPa) — 60 psig (0.41 MPa)
1/2 inch connections *)



AZ1200HF Inlet pressure: ---- 150 psig (1.0 MPa) ---- 100 psig (0.69 MPa)
— 50 psig (0.34 MPa)



AZ1200FC Inlet pressure: 150 psig (1.0 MPa)
3/4 inch connections *)



*1) If connection size differs, flow characteristics also differ.

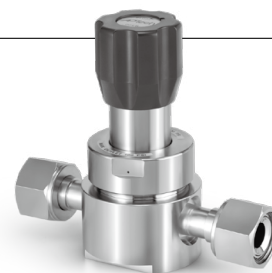
*2) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity

High flow
(Tied-diaphragm)

Series AZ9200

- For UHP gas delivery
- Inlet pressure: Max. 300 psig (2.1 MPa)
- Flow capacity to 2000 slpm
- Body material: 316L SS



RoHS

How to Order

AZ92 02 S 2PW FV12 FV12

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

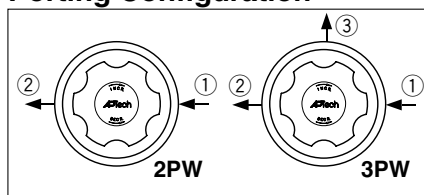
Material

Code	Body	Poppet	Diaphragm
S	316L SS	316L SS	Ni-Cr-Mo alloy

Ports

Code	Ports
2PW	2 ports
3PW	3 ports

Porting Configuration



① IN ② OUT ③ Gauge port (Outlet)

Connections (Inlet①, Outlet②)

Code	Connections
FV12	3/4 inch face seal (Female)
MV12	3/4 inch face seal (Male)
TW12	3/4 inch tube weld
FV16	1 inch face seal (Female)
MV16	1 inch face seal (Male)
TW16	1 inch tube weld

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *3)
BP	Bonnet port (NPT 1/8 inch)

*3) Panel mounting hole: dia. 39.6 mm.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Gauge port *1) (Outlet③)

Code	Pressure gauge	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch face seal male)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa

*1) Other range available. Refer to gauge guide (P.115).

Specifications

Operating Parameters		AZ9202	AZ9206	AZ9210	AZ9215
Delivery pressure		1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas			
Source pressure		Vacuum to 300 psig (2.1 MPa)			
Proof pressure (Inlet)		450 psig (3.1 MPa)			
Burst pressure		1500 psig (10.3 MPa)			
Ambient and operating temperature		-40 to 71°C (No freezing)			
Cv		1.6			
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s			
	Outboard leakage	1 x 10 ⁻¹⁰ Pa·m ³ /s *1)			
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *2)			
Surface finish		Ra 10 μin. (0.25 μm)			
Connections		Face seal, Tube weld			
Supply pressure effect		7 psig (0.048 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop			
Installation		Bottom mount (Option: panel mount)			
Internal volume		2.2 in ³ (36 cm ³)			

*1) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*2) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

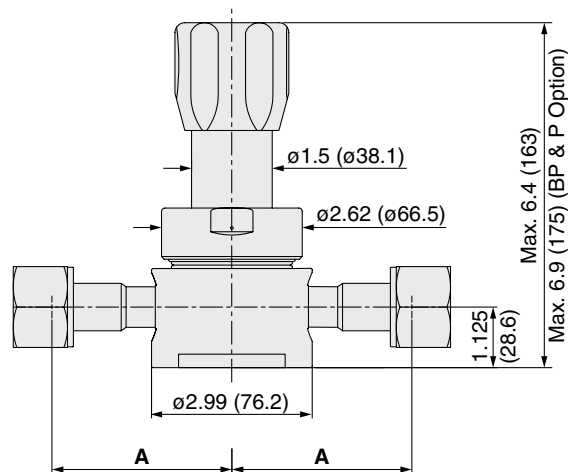
Wetted Parts Material

Wetted Parts	S
Body	316L SS
Surface finish	Electropolish + Passivation
Nozzle	316L SS
Poppet	316L SS
Diaphragm	Ni-Cr-Mo alloy
Seat	PFA

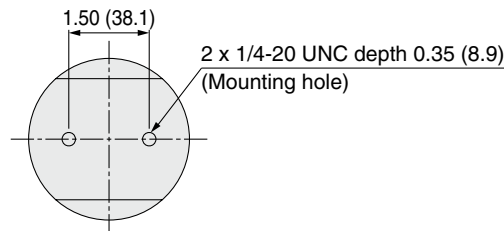
Dimensions

inch (mm)

AZ9200

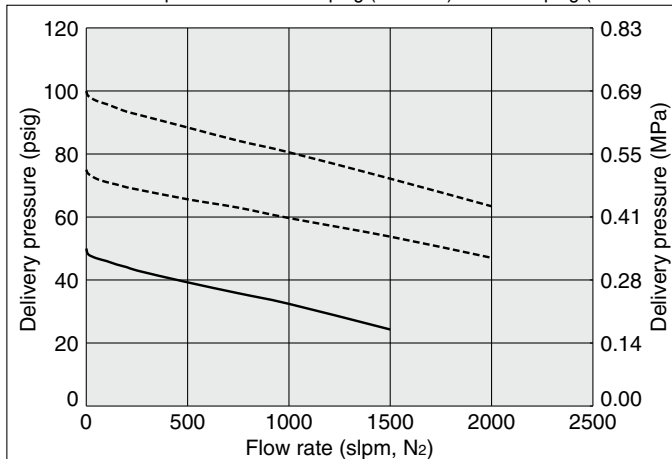


Connections	A	
	inch	(mm)
FV12	3.39	(86.1)
MV12	3.00	(76.2)
TW12	3.00	(76.2)
FV16	3.67	(93.2)
MV16	3.00	(76.2)
TW16	3.00	(76.2)



Flow Characteristics

AZ9200 Inlet pressure: ---- 150 psig (1.0 MPa) — 100 psig (0.69 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for Ultra High Purity

Delivery of
sub-atmospheric pressure

Series AZ1100

- For UHP gas delivery
- Sub-atmospheric to low positive pressure delivery
- Flow capacity to 0.5 slpm
- Body material: 316L SS
- Ni-Cr-Mo alloy internals available for corrosion resistance



RoHS

How to Order

AZ11 01 S 2PW FV4 FV4

Port Number

Delivery pressure

Code	Delivery pressure
01	100 mm Hg absolute to 10 psig (-88 kPa to 0.07 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SHP	316L SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	316L SS

Surface finish

Code	Surface finish Ra
No code	10 μin. (0.25 μm) Standard
Q	25 μin. (0.62 μm)

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

Connections (Inlet ①, Outlet ②)

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

Seal material

Code	Material
No code	PCTFE (Standard)
TF	PTFE *3)

*3) PTFE recommended for applications such as within a process tool.

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *4)
BP	Bonnet port (NPT 1/8 inch)

*4) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch face seal male)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
2	0 to 200 psig	0 to 1.4 MPa
4	0 to 400 psig	0 to 3 MPa

*1) Other range available. Refer to gauge guide (P.115). Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Porting Configuration

① IN ② OUT ③ Gauge port (Inlet)
④ Gauge port (Outlet)

Sample Order Number

Port	①	②	③	④
AZ1101S	2PW	FV4	FV4	
	3PW	FV4	FV4	0
	3PW	FV4	FV4	V3 MPA
	4PW	FV4	FV4	V3 V3 MPA
	4PW	FV4	FV4	0 0

Specifications

Operating Parameters		AZ1101
Delivery pressure		100 mm Hg absolute to 10 psig (-88 kPa to 0.07 MPa)
Gas		Select compatible materials of construction for the gas
Source pressure		Vacuum to 300 psig (2.1 MPa)
Proof pressure (Inlet)		500 psig (3.4 MPa)
Burst pressure		8000 psig (55.2 MPa)
Ambient and operating temperature		-40 to 71°C (No freezing)
Cv		0.05
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *1)
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *1)
Surface finish		Ra 10 μin. (0.25 μm) Option: 25 μin. (0.62 μm)
Connections		Face seal, Tube weld
Installation		Bottom mount (Option: panel mount)
Internal volume		0.49 in ³ (8 cm ³)
Weight		1.25 kg *2)

*1) Tested with Helium gas inlet pressure 300 psig (2.1 MPa).

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

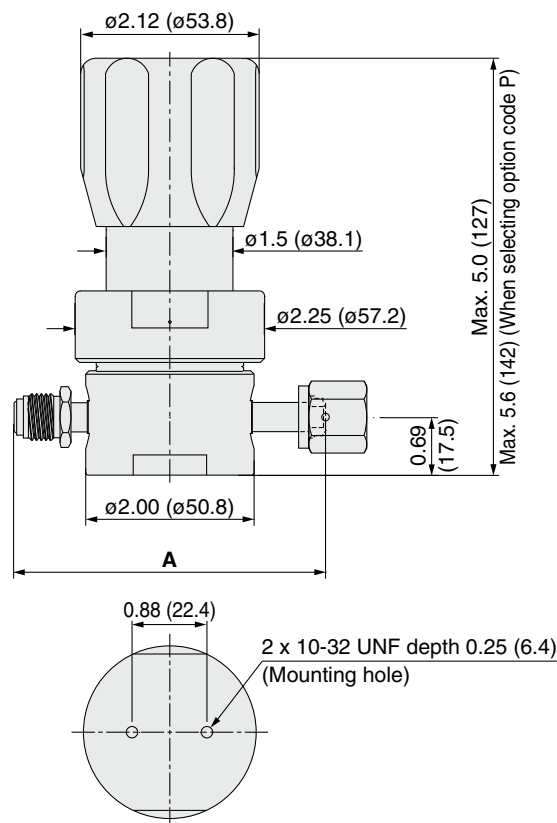
Wetted Parts Material

Wetted Parts	S	SHP
Body	316L SS	
Surface finish	Electropolish + Passivation	
Poppet	316L SS	Ni-Cr-Mo alloy
Diaphragm	316L SS	Ni-Cr-Mo alloy
Nozzle	316L SS	
Seat	PCTFE (Option: PTFE)	

Dimensions

inch (mm)

AZ1100

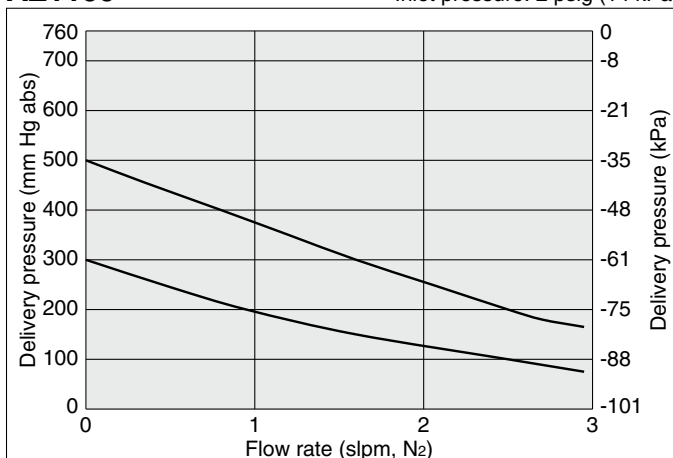


Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4		
FV6	4.70	(119.4)
MV6		
TW6	2.96	(75.2)

Flow Characteristics

AZ1100

Inlet pressure: 2 psig (14 kPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for General Applications

Low to intermediate flow

Series AK1000

- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity Standard: to 30 slpm
HF (option): to 120 slpm
- Body material: Stainless steel and Brass available
- Ni-Cr-Mo alloy internals available for corrosion resistance



RoHS

How to Order

AK10 01 S 4PL 4 4 0 0 0 0 0 0 0 0

Material			
Code	Body	Poppet	Diaphragm
B	Brass	316 SS	316 SS
S	316 SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy
SH	316 SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy

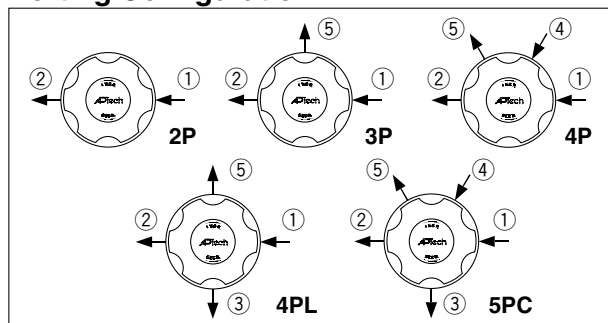
Ports		
Code	Ports	Material
		B S, SH
2P	Refer to the following porting configurations.	
3P		
4P		
4PL		
5PC		

Connections	
Code	Connections
4	NPT 1/4 inch
4T	1/4 inch compression
6T	3/8 inch compression

Delivery pressure

Code	Delivery pressure	Code	Delivery pressure
01	0.5 to 10 psig (0.0034 to 0.07 MPa)	15	5 to 150 psig (0.034 to 1.0 MPa)
02	1 to 30 psig (0.007 to 0.2 MPa)	20	5 to 200 psig (0.034 to 1.4 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)	30	5 to 300 psig (0.034 to 2.1 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)	50	10 to 500 psig (0.07 to 3.4 MPa)

Porting Configuration



① IN ② OUT ③ Extra bottom port (Outlet) ④ Gauge port (Inlet) ⑤ Gauge port (Outlet)

Specifications

Operating Parameters	AK1001	AK1002	AK1006	AK1010	AK1015	AK1020	AK1030	AK1050
Delivery pressure	0.5 to 10 psig (0.0034 to 0.07 MPa)	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa)	5 to 200 psig (0.034 to 1.4 MPa)	5 to 300 psig (0.034 to 2.1 MPa)	10 to 500 psig (0.07 to 3.4 MPa)
Gas	Select compatible materials of construction for the gas							
Source pressure	Vacuum to 300 psig (2.1 MPa)	Vacuum to 3500 psig (24.1 MPa) *1)						
Proof pressure (Inlet)	4500 psig (30.7 MPa)							
Burst pressure	10000 psig (69 MPa)							
Ambient and operating temperature	-40 to 71 °C (No freezing) *2)							
Cv	0.09							
Leak rate	1 x 10 ⁻¹⁰ Pa·m³/s							
Connections	NPT female, Compression							
Supply pressure effect	0.38 psig (0.0026 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop							
Installation	Bottom mount (Option: panel mount)							
Internal volume	0.49 in³ (8 cm³)							
Weight	1.09 kg *3)							

*1) Max. 300 psig (2.1 MPa) for PTFE seat.

*2) Max. 90°C for Polyimide and PEEK seat. Optional ambient and operating temperature range available. Please contact SMC.

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

Option**High flow**

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

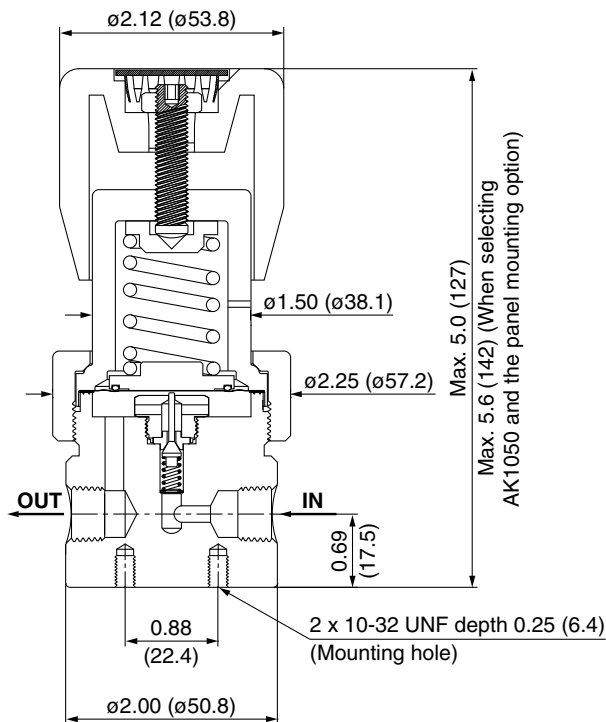
Option	Other Parameters	AK1001	AK1002	AK1006	AK1010	AK1015	AK1020	AK1030	AK1050
HF	Cv	0.15							
	Supply pressure effect	0.75 psig (0.0052 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop							

Wetted Parts Material

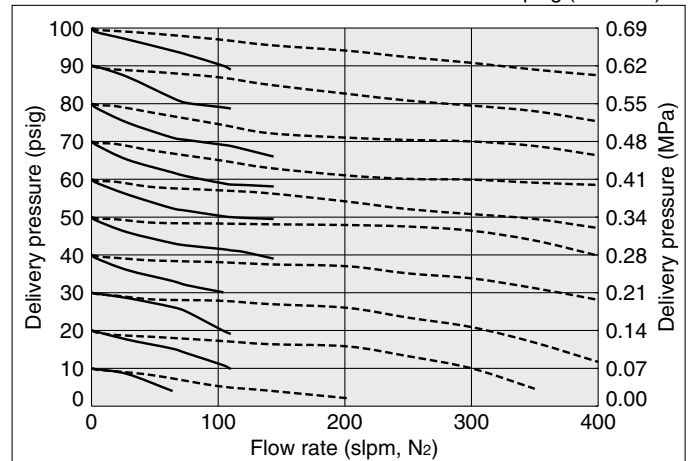
Wetted Parts	B	S	SH
Body	Brass	316 SS	
Poppet	316 SS		Ni-Cr-Mo alloy
Diaphragm	316 SS		Ni-Cr-Mo alloy
Seat	PCTFE (Option: Polyimide, PEEK, PTFE)		PCTFE (Option: PEEK, PTFE)

Dimensions

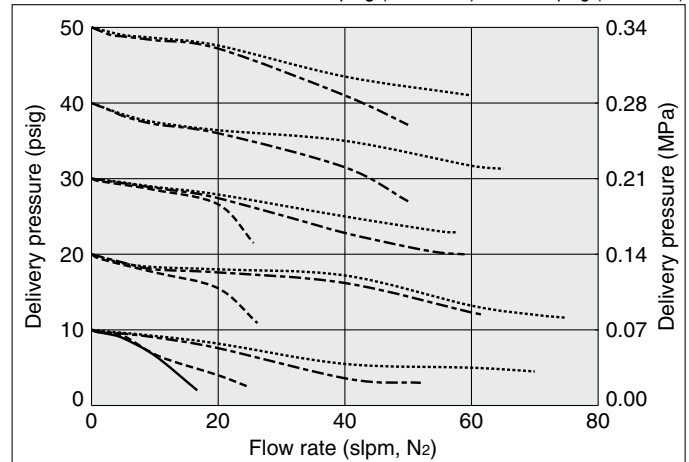
inch (mm)

AK1000**Flow Characteristics****AK1000**

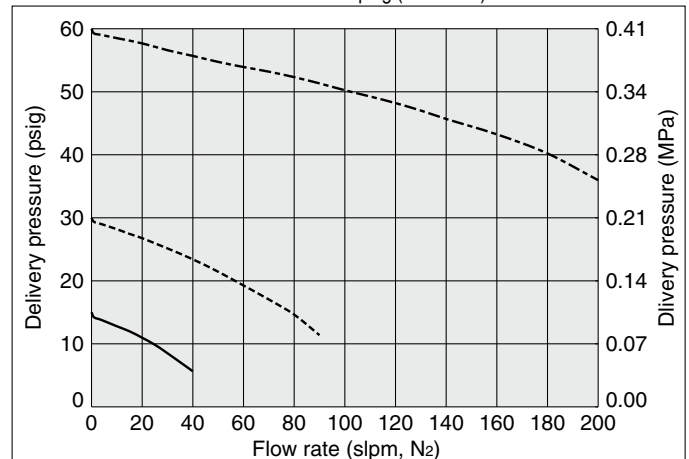
Inlet pressure: ---- 3000 psig (20.7 MPa)
— 200 psig (1.4 MPa)

**AK1000**

Inlet pressure: 100 psig (0.69 MPa) --- 80 psig (0.55 MPa)
----- 40 psig (0.28 MPa) — 20 psig (0.14 MPa)

**AK1000HF**

Inlet pressure: --- 100 psig (0.69 MPa) ---- 50 psig (0.34 MPa)
— 30 psig (0.21 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for General Applications

Low flow
(Tied-diaphragm)

Series AK1500

- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity: to 30 slpm
- Body material: Stainless steel and Brass available
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Tied-diaphragm design



RoHS

How to Order

AK15 02 S 4PL 4 4 0 0

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

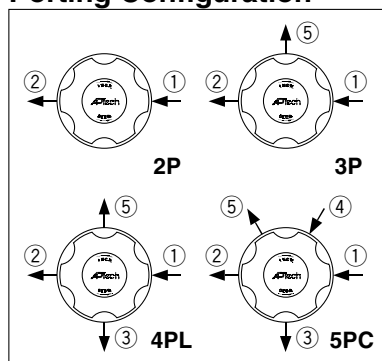
Material

Code	Body	Poppet	Diaphragm
B	Brass	316 SS	316 SS
S	316 SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy
SH			

Ports

Code	Ports	Material
		B S, SH
2P		●
3P	Refer to the following porting configurations.	●
4PL		●
5PC		●

Porting Configuration



① IN ② OUT ③ Extra bottom port (Outlet) ④ Gauge port (Inlet) ⑤ Gauge port (Outlet)

Port Number

① ② ③ ④ ⑤

Connections (Inlet①, Outlet②)

Code	Connections
4	NPT 1/4 inch
4T	1/4 inch compression
6T	3/8 inch compression

Gauge port

(Extra bottom outlet③, Inlet④, Outlet⑤)

Code	Pressure gauge *1
	psig/bar unit MPa unit
No code	No gauge port
0	No pressure gauge (Gauge port: 1/4 inch NPT) *2
C	No pressure gauge (1/4 inch NPT plug is installed before shipment.)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	-30 in.Hg to 160 psig 0 to 1.5 MPa
10	0 to 1000 psig 0 to 7 MPa
40	0 to 4000 psig 0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

*2) 1/4 inch NPT plug is included only for port code 4PL and 5PC.

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *4)

*4) Panel mounting hole: dia. 1.42 inch (36.1 mm).

Seat material

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

*3) Not available with SH material.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Sample Order Number

Port	①	②	③	④	⑤
AK1510S	2P	4	4		
	3P	4	4		1
	4PL	4	4	0	1
	4PL	4	4	0	0
	5PC	4	4	0	40

Specifications

Operating Parameters	AK1502	AK1506	AK1510	AK1515
Delivery pressure	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa)
Gas	Select compatible materials of construction for the gas			
Source pressure	Vacuum to 3500 psig (24.1 MPa)			
Proof pressure (inlet)	4500 psig (30.7 MPa)			
Burst pressure	10000 psig (69 MPa)			
Ambient and operating temperature	-40 to 71°C (No freezing) *1)			
Cv	0.09			
Leak rate	1 x 10 ⁻¹⁰ Pa·m ³ /s			
Connections	NPT female, Compression			
Supply pressure effect	0.41 psig (0.0028 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop			
Installation	Bottom mount (Option: panel mount)			
Internal volume	0.49 in ³ (8 cm ³)			
Weight	1.18 kg *2)			

*1) Max. 90°C for Polyimide and PEEK seat. Optional ambient and operating temperature range available. Please contact SMC.

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

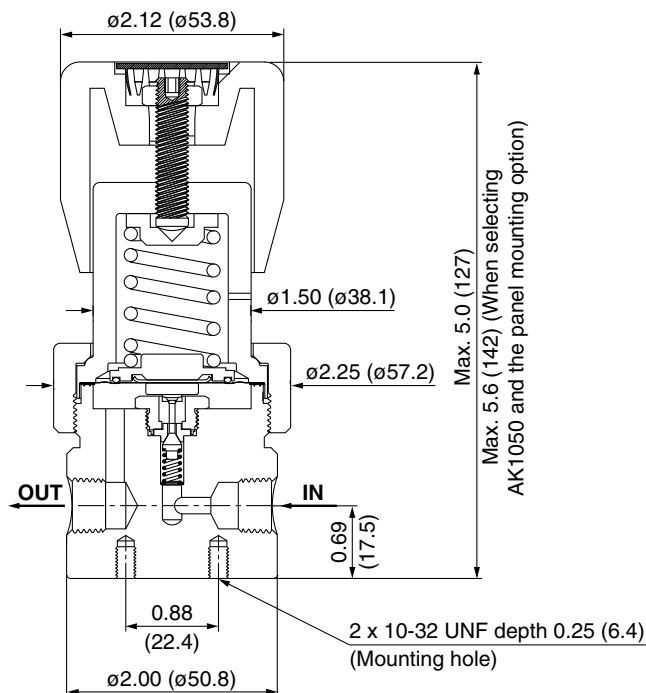
Wetted Parts Material

Wetted Parts	B	S	SH
Body	Brass	316 SS	
Poppet		316 SS	Ni-Cr-Mo alloy
Diaphragm		316 SS	Ni-Cr-Mo alloy
Seat		PCTFE (Option: Polyimide, PEEK)	PCTFE (Option: PEEK)

Dimensions

inch (mm)

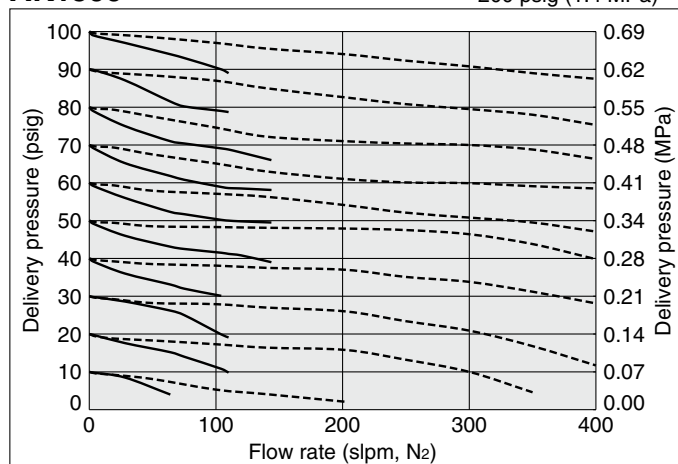
AK1500



Flow Characteristics

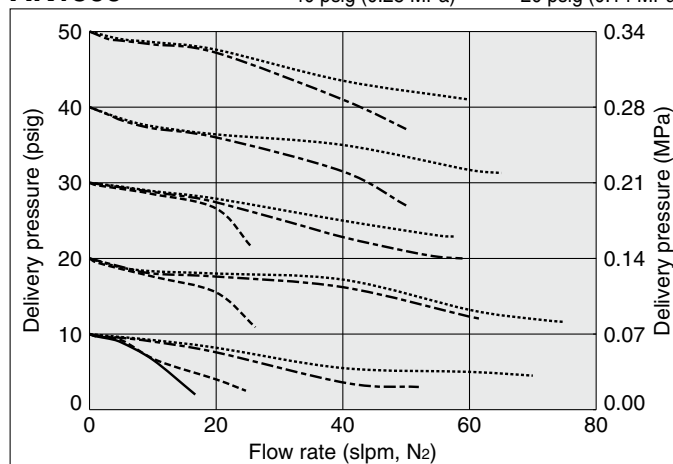
AK1500

Inlet pressure: --- 3000 psig (20.7 MPa)
— 200 psig (1.4 MPa)



AK1500

Inlet pressure: 100 psig (0.69 MPa) --- 80 psig (0.55 MPa)
--- 40 psig (0.28 MPa) — 20 psig (0.14 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for General Applications

Intermediate flow
(Tied-diaphragm)

Series AK1400T

- High inlet pressure type Standard: Max. 2300 psig (15.9 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity to 400 slpm
- Body material: Stainless steel and Brass available
- Ni-Cr-Mo alloy internals standard
- Sub-atmospheric pressure delivery option
- Tied-diaphragm design



RoHS

How to Order

AK14 02 T S 4PL 6 6 0 0 0 0 0 0

Port Number
① ② ③ ④ ⑤

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa) Sub-atmospheric (A): 100 mm Hg absolute to 30 psig (-88 kPa to 0.2 MPa)
06	1 to 60 psig (0.007 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

Ports

Code	Ports	Material
2P	Refer to the following	B S, SH
3P	porting	● ●
4PL	configurations.	● ●
5PC		● ●

Pressure gauge unit *3)

Code	Unit
No code	psig/bar
MPA	MPa

*3) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation*6)
BP	Bonnet port (NPT 1/8 inch)

*6) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Material

Code	Body	Poppet	Diaphragm	Nozzle
B	Brass			
S	316 SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	316 SS
SH				Ni-Cr-Mo alloy

Range options *1)

Code	Specification
No code	Standard
A	Sub-atmospheric

*1) Only available with AK1402T.

Seat material

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

*4) Not available with SH material.

Option

Code	Specification
No code	Standard
HR	High inlet pressure (Max. inlet pressure 3000 psig (20.7 MPa)) *5)

*5) Not available with AK1402T and AK1406T.

Porting Configuration

① IN ② OUT ③ Extra bottom port (Outlet)
④ Gauge port (Inlet) ⑤ Gauge port (Outlet)

Connections (Inlet①, Outlet②)

Code	Connections
4	NPT 1/4 inch
6	NPT 3/8 inch
8	NPT 1/2 inch
4T	1/4 inch compression
6T	3/8 inch compression
8T	1/2 inch compression

Sample Order Number

AK1410TS
Port ① ② ③ ④ ⑤

2P	6	6			
3P	6	6		1	MPa
4PL	6	6	0	1	MPa
4PL	6	6	0	0	
5PC	6	6	0	40	1 MPa

Pressure gauge *2)

Code	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Gauge port: 1/4 inch NPT) *2)	
C	No pressure gauge (1/4 inch NPT plug is installed before shipment.)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
V2	-30 in.Hg to 200 psig	-0.1 to 1.4 MPa
2	-30 in.Hg to 160 psig	0 to 1.5 MPa
4	0 to 400 psig	0 to 3 MPa
10	0 to 1000 psig	0 to 7 MPa
30	0 to 3000 psig	0 to 21 MPa
40	0 to 4000 psig	0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.
*2) 1/4 inch NPT plug is included only for port code 4PL and 5PC.

Specifications

Operating Parameters	AK1402T□A	AK1402T	AK1406T	AK1410T	AK1415T
Delivery pressure	100 mm Hg absolute to 30 psig (-88 kPa to 0.2 MPa)	1 to 30 psig (0.007 to 0.2 MPa)	1 to 60 psig (0.007 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa) (Source pressure 1000 psig or less) *1
Gas	Select compatible materials of construction for the gas				
Source pressure	Vacuum to 300 psig (2.1 MPa)	Vacuum to 2300 psig (15.9 MPa)			
Proof pressure (Inlet)	4000 psig (27.6 MPa)				
Burst pressure	8000 psig (55.2 MPa)				
Ambient and operating temperature	-40 to 71 °C (No freezing) *2)				
Cv	0.45				
Leak rate	1 x 10 ⁻¹⁰ Pa·m³/s				
Connections	NPT female, Compression				
Supply pressure effect	1.6 psig (0.011 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				
Installation	Bottom mount (Option: panel mount)				
Internal volume	0.65 in³ (10.6 cm³)				
Weight	2.04 kg *3)				

*1) Source pressure above 1000 psig (6.9 MPa) decreases maximum delivery pressure to less than 150 psig (1 MPa) due to supply pressure effect. When the source pressure is 2300 psig (15.9 MPa), achievable delivery pressure is around 129 psig (0.89 MPa).

*2) Max. 90°C for Polyimide seat.

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

Option

High inlet pressure

Changes from the standard type are:

Option	Other Parameters	AK1410T	AK1415T
HR	Source pressure	Vacuum to 3000 psig (20.7 MPa)	
	Proof pressure (Inlet)	4500 psig (31 MPa)	
	Burst pressure	9000 psig (62 MPa)	

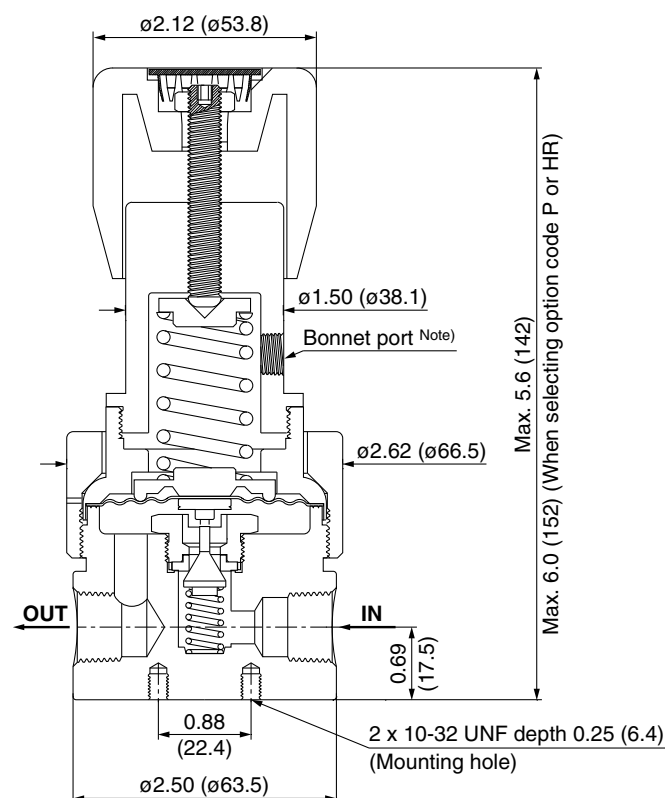
Wetted Parts Material

Wetted Parts	B	S	SH
Body	Brass	316 SS	
Poppet		Ni-Cr-Mo alloy	
Diaphragm		Ni-Cr-Mo alloy	
Nozzle		316 SS	Ni-Cr-Mo alloy
Seat	PCTFE (Option: Polyimide)		PCTFE

Dimensions

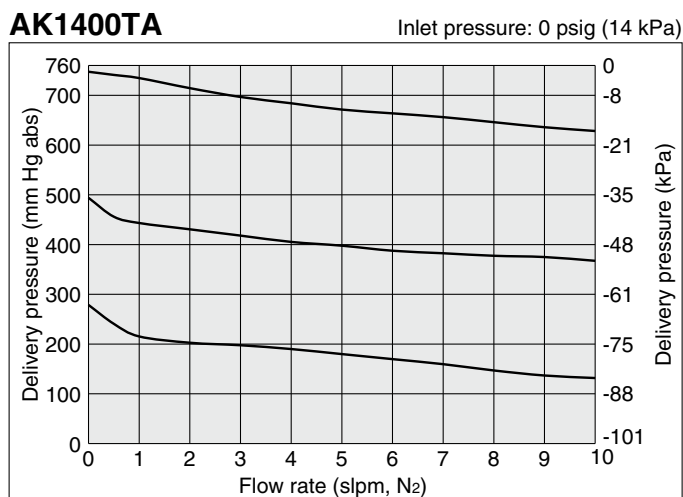
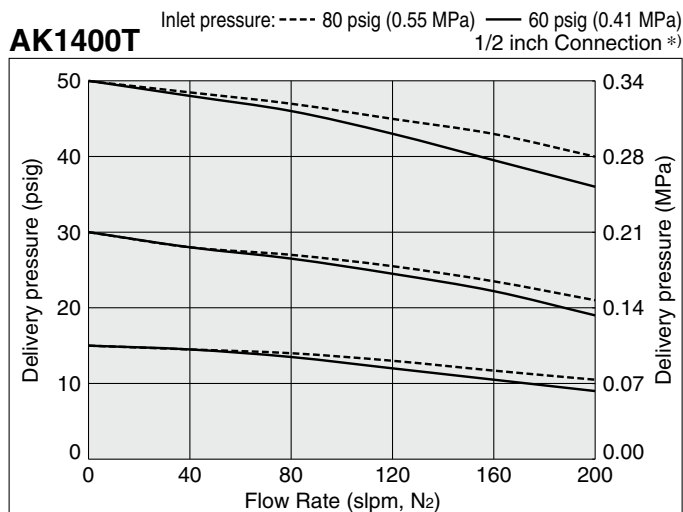
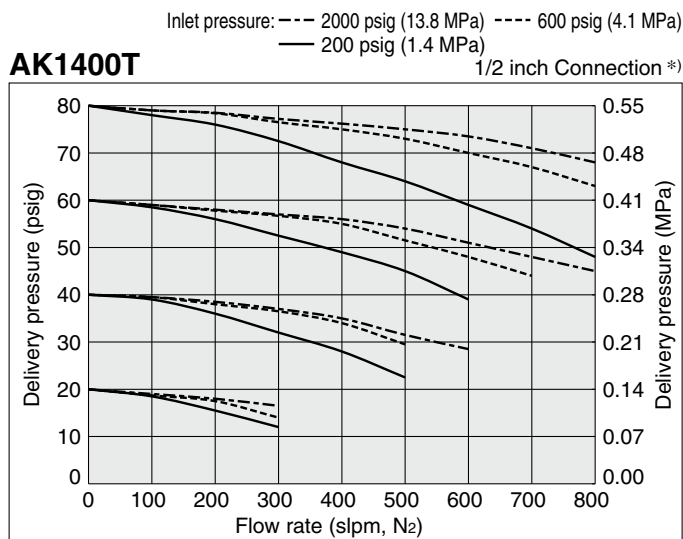
inch (mm)

AK1400T



Note) The standard port is $\phi 1.5$. When selecting the AK1402TA or the option code P or HR, the connection is NPT1/8 female thread.

Flow Characteristics



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for General Applications High flow

Series AK1300

- Flow capacity to 1000 slpm
- Body material: Stainless steel and Brass available
- Inlet pressure: Max. 300 psig (2.1 MPa)



RoHS

How to Order

AK13 02 S 4PL 8 8 0 0

Port Number ① ② ③ ④

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm
B	Brass	316 SS	Ni-Cr-Mo alloy
S	316 SS		

Connections (Inlet ①, Outlet ②)

Code	Connections
4	NPT 1/4 inch
6	NPT 3/8 inch
8	NPT 1/2 inch
4T	1/4 inch compression
6T	3/8 inch compression
8T	1/2 inch compression

Gauge port (Outlet ③, ④)

Code	Pressure gauge *1
No code	No gauge port
0	No pressure gauge (Gauge port: 1/4 inch NPT) *2
C	No pressure gauge (1/4 inch NPT plug is installed before shipment.)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	-30 in.Hg to 160 psig 0 to 1.5 MPa

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation*4
BP	Bonnet port (NPT 1/8 inch)

*4) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Seat material

Code	Material
No code	PCTFE (Standard)
TF	PTFE *3

*3) PTFE seats reduce seat abrasion for flow cycle application. Gas permeation is greater with PTFE than PCTFE.

Pressure gauge unit *2

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Ports

Code	Ports	Material
2P	Refer to the following porting configurations.	B, S, SH
3P		
4PL		

Porting Configuration

① IN ② OUT ③ ④ Gauge port (Outlet)

Sample Order Number

Port	①	②	③	④
AK1302S	2P	6	6	
	3P	6	6	V3 MPA
	4PL	6	6	0 V3 MPA
	4PL	8	8	0 0

Specifications

Operating Parameters	AK1302	AK1306	AK1310	AK1315
Delivery pressure	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa)
Gas	Select compatible materials of construction for the gas			
Source pressure	Vacuum to 300 psig (2.1 MPa)			
Proof pressure (Inlet)	450 psig (3.1 MPa)			
Burst pressure	1200 psig (8.3 MPa)			
Ambient and operating temperature	-40 to 71°C (No freezing)			
Cv	1.1			
Leak rate	1 x 10 ⁻¹⁰ Pa·m ³ /s			
Connections	NPT female, Compression			
Supply pressure effect	4.6 psig (0.031 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop			
Installation	Bottom mount (Option: panel mount)			
Internal volume	0.65 in ³ (10.6 cm ³)			
Weight	2.0 kg *			

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

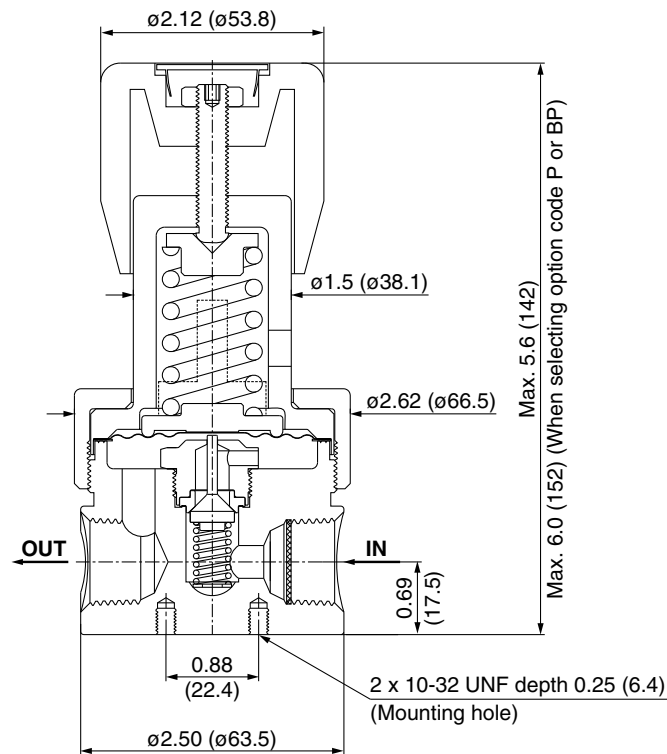
Wetted Parts Material

Wetted Parts	B	S
Body	Brass	316 SS
Poppet	316 SS	
Diaphragm	Ni-Cr-Mo alloy	
Seat	PCTFE (Option: PTFE)	

Dimensions

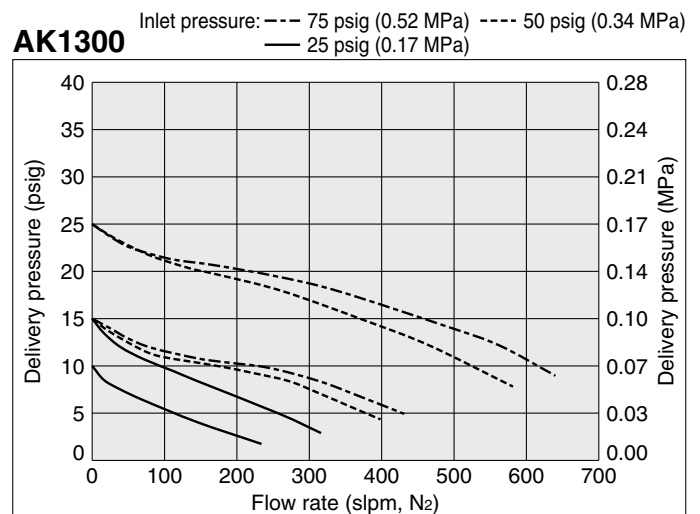
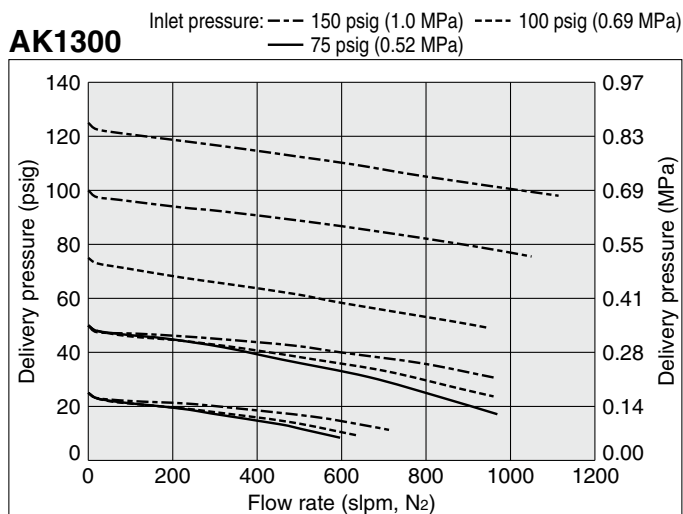
inch (mm)

AK1300



Note) The standard port is $\varnothing 1.5$. When selecting the option code P, the connection is NPT1/8 female thread.

Flow Characteristics



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Single Stage Regulator for General Applications

High flow
(Tied-diaphragm)

Series AK1200

- High inlet pressure type Standard: Max. 1700 psig (11.7 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity Standard: to 800 slpm
HF (option): to 1000 slpm
FC (option): to 1500 slpm
- Body material: Stainless steel and Brass available
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Tied-diaphragm design



RoHS

How to Order

AK12 02 S 4PL 8 8 0 0 0 0 0 0

Port Number
① ② ③ ④ ⑤

Material

Code	Body	Poppet	Diaphragm
B	Brass	316 SS	Ni-Cr-Mo alloy
S			
SH	316 SS	Ni-Cr-Mo alloy	

Ports

Code	Ports	Material
2P	Refer to the following porting configurations.	B, S, SH
3P		
4PL		
5PC		

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *6)
BP	Bonnet port (NPT 1/8 inch)

*6) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Option

Code	Specification
No code	Standard (Cv: 0.65)
HF	High flow (Cv: 1.1)
FC	Force compensation (Cv: 0.65) *4) *5)
HR	High inlet pressure (Max. inlet pressure 3000 psig (20.7 MPa)) *4)

*4) FC option is not available with AK1202, AK1206 and AK1225.
*5) FC option is available with 1/2 inch NPT or 1/2 inch compression.

Seat material

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

*3) Not available with SH material.

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)
25	Preset to 250 psig (1.7 MPa)

Connections (Inlet ①, Outlet ②)

Code	Connections
4	NPT 1/4 inch
6	NPT 3/8 inch
8	NPT 1/2 inch
4T	1/4 inch compression
6T	3/8 inch compression
8T	1/2 inch compression

Gauge port (Extra bottom outlet ③, Inlet ④, Outlet ⑤)

Code	Pressure gauge *1)
No code	No gauge port
0	No pressure gauge (Gauge port: 1/4 inch NPT) *2)
C	No pressure gauge (1/4 inch NPT plug is installed before shipment.)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	-30 in.Hg to 160 psig 0 to 1.5 MPa
10	0 to 1000 psig 0 to 7 MPa
40	0 to 4000 psig 0 to 28 MPa

Porting Configuration

① IN ② OUT ③ Extra bottom port (Outlet)
④ Gauge port (Inlet) ⑤ Gauge port (Outlet)

Specifications

Operating Parameters	AK1202	AK1206	AK1210	AK1215	AK1225
Delivery pressure	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa) (Source pressure 1000 psig or less) *1)	Preset to 250 psig (1.7 MPa) *2)
Gas	Select compatible materials of construction for the gas				
Source pressure	Vacuum to 1700 psig (11.7 MPa)				
Proof pressure (Inlet)	2550 psig (17.6 MPa)				
Burst pressure	9000 psig (62 MPa)				
Ambient and operating temperature	-40 to 71°C (No freezing) *3)				
Cv	0.65				
Leak rate	1 x 10 ⁻¹⁰ Pa·m ³ /s				
Connections	NPT female, Compression				
Supply pressure effect	3.5 psig (0.024 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				
Installation	Bottom mount (Option: panel mount)				
Internal volume	0.65 in ³ (10.6 cm ³)				
Weight	2.0 kg *4)				

- *1) Source pressure above 1000 psig (6.9 MPa) decreases maximum delivery pressure to less than 150 psig (1 MPa) due to supply pressure effect. When the source pressure is 1700 psig (11.7 MPa), achievable delivery pressure is around 125 psig (0.86 MPa) (HF and FC option 120 psig (0.83 MPa)).
- *2) 250 psig outlet pressure preset at 800 psig (5.5 MPa) inlet pressure. Custom inlet/outlet pressure settings available. Please contact SMC.
- *3) Max. 90°C for Polyimide seat. Optional ambient and operating temperature range available. Please contact SMC.
- *4) Weight, including individual boxed weight, may vary depending on connections or options.

Single Stage Regulator for General Applications *Series AK1200*

High flow (Tied-diaphragm)

Options

1.High flow Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AK1202	AK1206	AK1210	AK1215	AK1225
HF	Cv			1.1		
	Supply pressure effect	4.2 psig (0.029 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop				

2. Force compensation Force compensation feature added to HF option and has higher flow capacity than HF option. Changes from the standard type are:

Option	Other Parameters	AK1210	AK1215
FC	Source pressure	Vacuum to 300 psig (2.1 MPa)	
	Cv		0.65
	Supply pressure effect	4.2 psig (0.029 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop	
	Connections	NPT 1/2 inch, 1/2 inch compression	

3. High inlet pressure Changes from the standard type are:

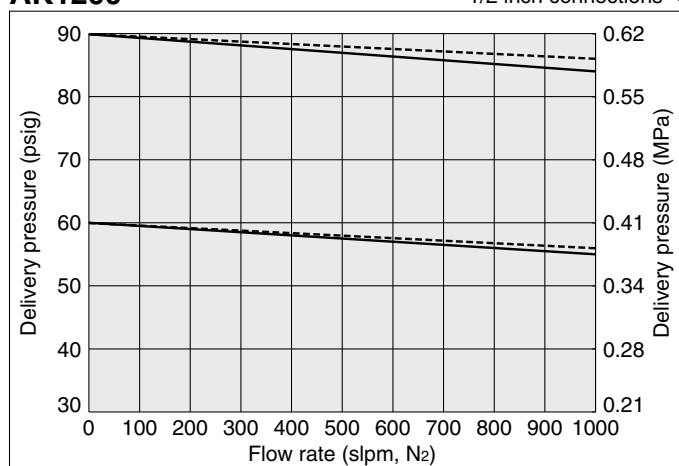
Option	Other Parameters	AK1210	AK1215
HR	Source pressure	Vacuum to 3000 psig (20.7 MPa)	
	Proof pressure (Inlet)	4500 psig (31 MPa)	
	Burst pressure	9000 psig (62 MPa)	

Wetted Parts Material

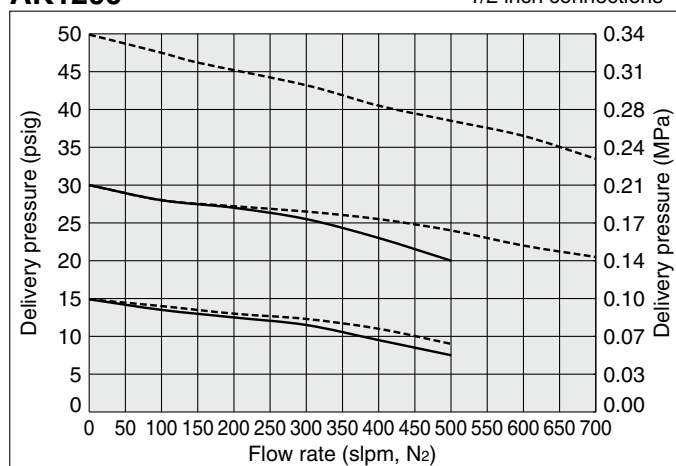
Wetted Parts	B	S	SH
Body	Brass	316 SS	316 SS
Poppet		316 SS	Ni-Cr-Mo alloy
Diaphragm		Ni-Cr-Mo alloy	
Seat	PCTFE (Option: Polyimide)		PCTFE

Flow Characteristics

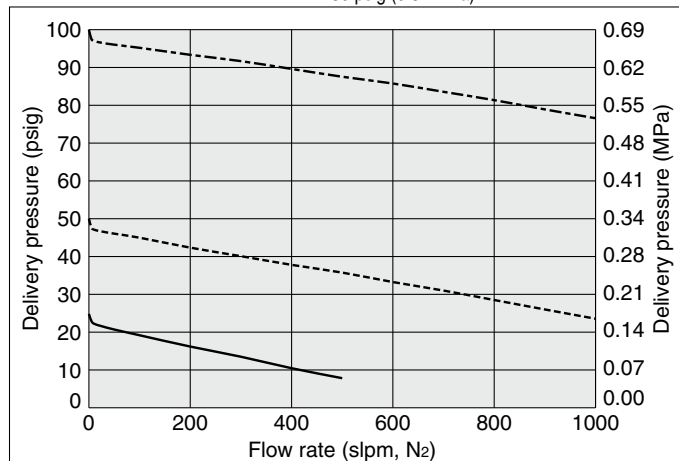
AK1200 Inlet pressure: ---- 1700 psig (11.7 MPa) — 500 to 1000 psig (3.4 to 6.9 MPa)
1/2 inch connections *)



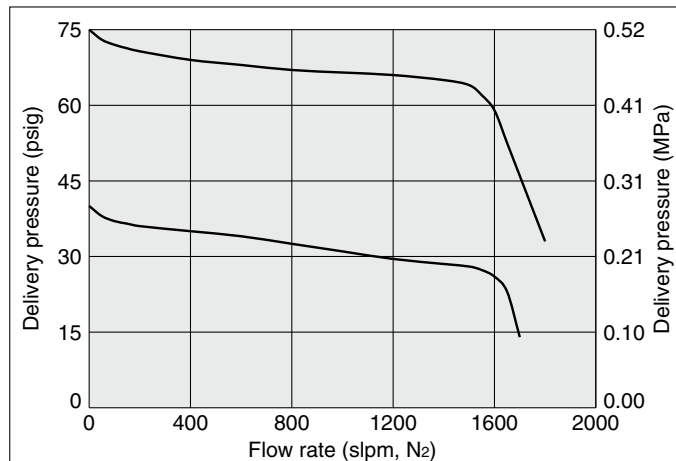
AK1200 Inlet pressure: ---- 80 psig (0.55 MPa) — 60 psig (0.41 MPa)
1/2 inch connections *)



AK1200HF Inlet pressure: --- 150 psig (1.0 MPa) --- 100 psig (0.69 MPa)
— 50 psig (0.34 MPa)



AK1200FC Inlet pressure: 150 psig (1.0 MPa)
3/4 inch connections *)

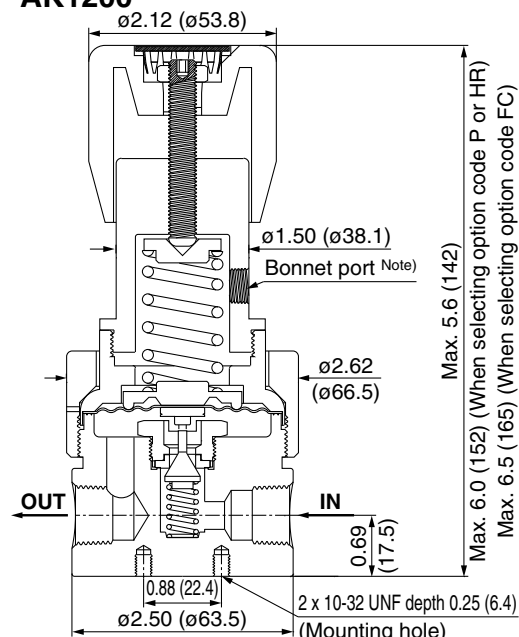


Note) slpm, N2: The volumetric flow rate under normal conditions (0°C, 1 atm) when N2 gas is flowing.

Dimensions

inch (mm)

AK1200



Note) The standard port is ø1.5. When selecting the option code P, HR, or FC, the connection is NPT1/8 female thread.

Single Stage Regulator for General Applications

High flow
(Tied-diaphragm)

Series AK9200

- 3/4 inch port size
- Inlet pressure: Max. 300 psig (2.1 MPa)
- Flow capacity: to 2000 slpm
- Body material: 316 SS



RoHS

How to Order

AK92 02 S 4PL 12 12 0 0

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
15	5 to 150 psig (0.034 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm
S	316 SS	316 SS	Ni-Cr-Mo alloy

Ports

Code	Ports
4PL	4 ports

Connections (Inlet ①, Outlet ②)

Code	Connections
12	NPT 3/4 inch

Gauge port (Outlet ③, ④)

Code	Pressure gauge *1	
	psig/bar unit	MPa unit
0	No pressure gauge (Gauge port: 1/4 inch NPT) *2	
C	No pressure gauge (1/4 inch NPT plug is installed before shipment.)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
2	-30 in.Hg to 160 psig	0 to 1.5 MPa

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *3
BP	Bonnet port (NPT 1/8 inch)

*3) Panel mounting hole: dia.39.6 mm.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration

① IN ② OUT
③ ④ Gauge port (Outlet)

Specifications

Operating Parameters	AK9202	AK9206	AK9210	AK9215
Delivery pressure	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 150 psig (0.034 to 1.0 MPa)
Gas	Select compatible materials of construction for the gas			
Source pressure	Vacuum to 300 psig (2.1 MPa)			
Proof pressure (Inlet)	450 psig (3.1 MPa)			
Burst pressure	1500 psig (10.3 MPa)			
Ambient and operating temperature	-40 to 71°C (No freezing)			
Cv	1.6			
Leak rate	1 x 10 ⁻¹⁰ Pa·m ³ /s			
Connections	NPT 3/4 inch			
Supply pressure effect	7 psig (0.048 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop			
Installation	Bottom mount (Option: panel mount)			
Internal volume	2.2 in ³ (36 cm ³)			

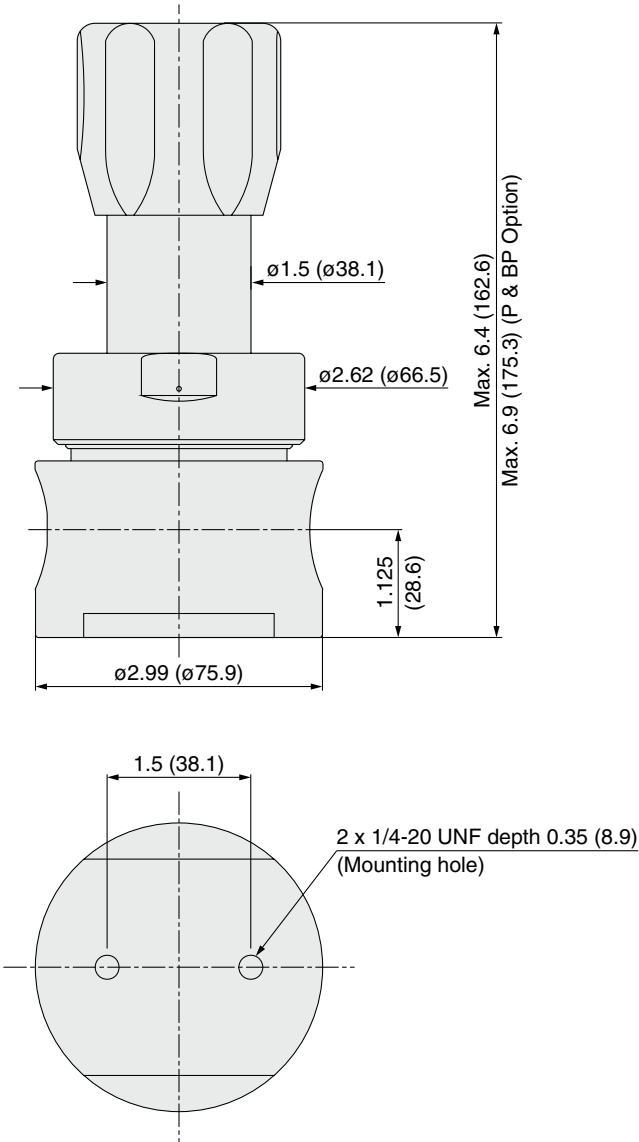
Wetted Parts Material

Wetted Parts	S
Body	316 SS
Nozzle	316 SS
Poppet	316 SS
Diaphragm	Ni-Cr-Mo alloy
Seat	PFA

Dimensions

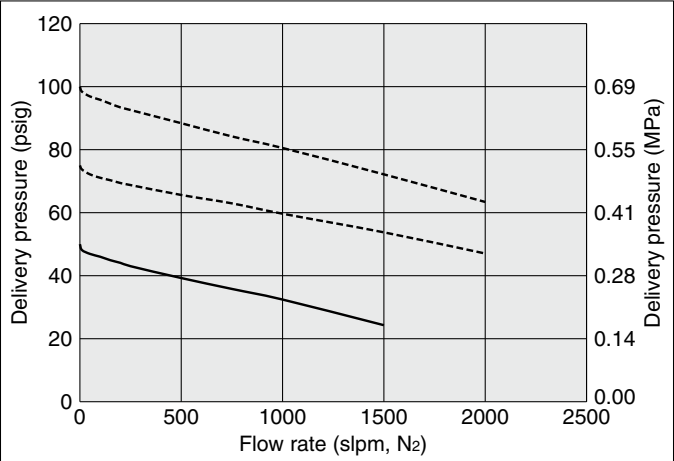
inch (mm)

AK9200



Flow Characteristics

AK9200 Inlet pressure: ---- 150 psig (1.0 MPa) — 100 psig (0.69 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Recommendations
Regulators
AP
SL
AZ
AK
BP
Diaphragm Valves
Check Valves
Vacuum Generators
Flow Switches
Technical Data/ Glossary of Terms
Precautions

Two Stage Regulator for General Applications

Low flow
(Tied-diaphragm)

Series AK1700

- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity Standard: to 30 slpm
- Body material: Stainless steel and Brass available
- Ni-Cr-Mo alloy internals available for corrosion resistance
- Minimizes supply pressure effect by two stage regulation
- Tied-diaphragm design



RoHS

How to Order

AK17 02 S 5PC 4 4 0 0 0

Port Number
① ② ③ ④ ⑤

Delivery pressure

Code	Delivery pressure
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	2 to 100 psig (0.014 to 0.7 MPa)
20	5 to 200 psig (0.034 to 1.4 MPa)

Material

Code	Body	Poppet	Diaphragm
B	Brass	316 SS	316 SS
S	316 SS		
SH		Ni-Cr-Mo alloy	Ni-Cr-Mo alloy

Connections (Inlet ①, Outlet ②)

Code	Connections
4	NPT 1/4 inch
4T	1/4 inch compression

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *4)

*4) Panel mounting hole: dia. 1.42 inch (36.1 mm).

Porting configuration

① IN ② OUT
③ Extra bottom port (Outlet)
④ Gauge port (Inlet)
⑤ Gauge port (Outlet)

Gauge port (Extra bottom outlet ③, Inlet ④, Outlet ⑤)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Gauge port: 1/4 inch NPT) *2)	
C	No pressure gauge (1/4 inch NPT plug is installed before shipment.)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
2	-30 in.Hg to 160 psig	0 to 1.5 MPa
10	0 to 1000 psig	0 to 7 MPa
40	0 to 4000 psig	0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.
*2) 1/4 inch NPT plug is included.

Poppet feature option

Code	Feature
No code	Standard (First and second stage tied diaphragm)
NT	First stage tied, second stage free poppet

Seat material

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

*3) Not available with SH material.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Sample Order Number

Port	①	②	③	④	⑤
AK1702S	5PC	4	4	0	0
	5PC	4	4	0	V3 40

Specifications

Operating Parameters	AK1702	AK1706	AK1710	AK1720
Delivery pressure	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	2 to 100 psig (0.014 to 0.7 MPa)	5 to 200 psig (0.034 to 1.4 MPa)
Gas	Select compatible materials of construction for the gas			
Source pressure	Vacuum to 3500 psig (24.1 MPa)			
First stage pressure	175 psig (1.2 MPa)			
Proof pressure (Inlet)	4500 psig (30.7 MPa)			
Burst pressure	8000 psig (55.2 MPa)			
Ambient and operating temperature	-40 to 71°C (No freezing) *1)			
Cv	0.05			
Leak rate	1 x 10 ⁻¹⁰ Pa·m ³ /s			
Connections	NPT female, Compression			
Supply pressure effect	0.05 psig (0.00035 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop			
Installation	Option: panel mount			
Internal volume	0.9 in ³ (15 cm ³)			
Weight	1.95 kg *2)			

*1) Max. 90°C for Polyimide and PEEK seat. Optional ambient and operating temperature range available. Please contact SMC.

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

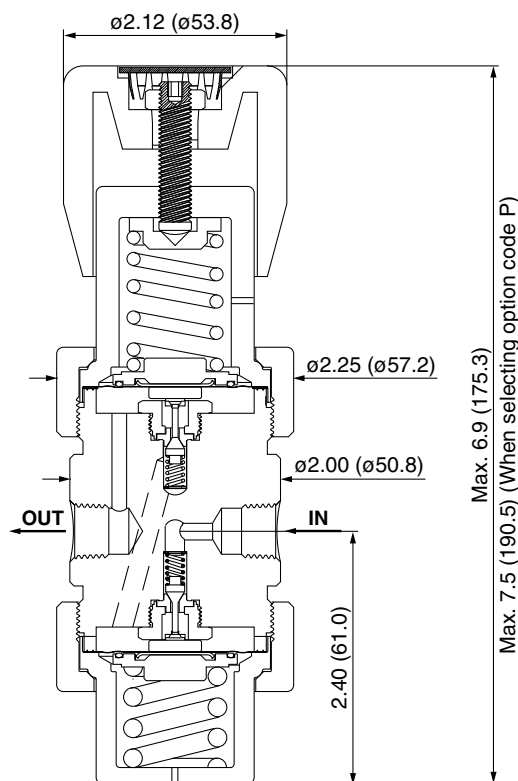
Wetted Parts Material

Wetted Parts	B	S	SH
Body	Brass	316 SS	
Poppet		316 SS	Ni-Cr-Mo alloy
Diaphragm		316 SS	Ni-Cr-Mo alloy
Seat		PCTFE (Option: Polyimide, PEEK)	PCTFE (Option: PEEK)

Dimensions

inch (mm)

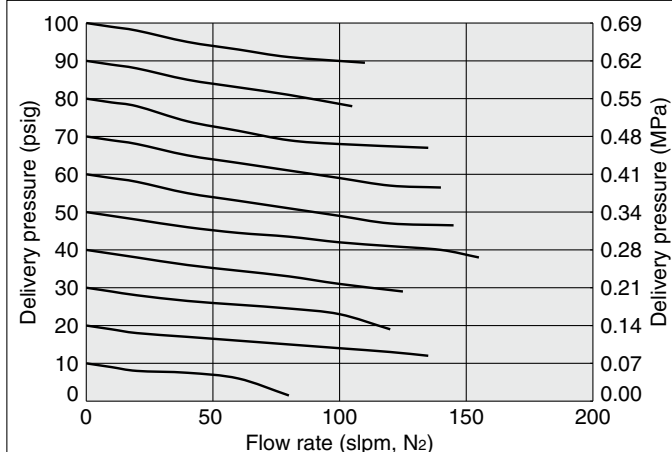
AK1700



Flow Characteristics

AK1700

Inlet pressure: 200 to 3000 psig (1.4 to 20.7 MPa)



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Back Pressure Regulator for General Applications

Series **BP1000**

- Operating pressure: 0.5 to 300 psig (0.0034 to 2.1 MPa)
- Body material: Stainless steel and Brass available
- Ni-Cr-Mo alloy internals available for corrosion resistance



RoHS

How to Order

BP10 01 S 4PL 4 4 0 0

Port Number ① ② ③ ④

Operating pressure

Code	pressure
01	0.5 to 10 psig (0.0034 to 0.07 MPa)
02	1 to 30 psig (0.007 to 0.2 MPa)
06	2 to 60 psig (0.014 to 0.4 MPa)
10	5 to 100 psig (0.034 to 0.7 MPa)
20	15 to 200 psig (0.1 to 1.4 MPa)
30	15 to 300 psig (0.1 to 2.1 MPa)

Material

Code	Body	Nozzle	Diaphragm
B	Brass	316 SS	316 SS
S	316 SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy
SH	316 SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy

Ports

Code	Ports	Material
2P	Please refer to the following porting configurations.	B, S, SH
4PL		●

Porting Configuration

① IN ② OUT ③④ Gauge port (Inlet)

Connections (Inlet ①, Outlet ②)

Code	Connections
4	NPT 1/4 inch
4T	1/4 inch compression

Gauge port (Inlet ③, ④)

Code	Pressure gauge *1
No code	No gauge port
0	No pressure gauge *2 (Gauge port: 1/4 inch NPT)
C	No pressure gauge (1/4 inch NPT plug is installed before shipment.)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
V2	-30 in.Hg to 200 psig -0.1 to 1.4 MPa
2	-30 in.Hg to 160 psig 0 to 1.5 MPa
4	0 to 400 psig 0 to 3 MPa
10	0 to 1000 psig 0 to 7 MPa

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *3)

*3) Panel mounting hole: dia. 1.42 inch (36.1 mm).

Seat material

Code	Material
No code	FKM (Standard)
TF	PTFE
KZ	FFKM

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Sample Order Number

Port		③	④
BP10	01 S	2P	4 4
	4PL	4 4	0 1 MPA

Specifications

Operating Parameters	BP1001	BP1002	BP1006	BP1010	BP1020	BP1030
Operating pressure	0.5 to 10 psig (0.0034 to 0.07 MPa)	1 to 30 psig (0.007 to 0.2 MPa)	2 to 60 psig (0.014 to 0.4 MPa)	5 to 100 psig (0.034 to 0.7 MPa)	15 to 200 psig (0.1 to 1.4 MPa)	15 to 300 psig (0.1 to 2.1 MPa)
Gas	Select compatible materials of construction for the gas					
Proof pressure (Inlet)	15 psig (0.105 MPa)	45 psig (0.3 MPa)	90 psig (0.6 MPa)	150 psig (1.05 MPa)	300 psig (2.1 MPa)	450 psig (3.15 MPa)
Burst pressure	30 psig (0.2 MPa)	90 psig (0.6 MPa)	180 psig (1.2 MPa)	300 psig (2.1 MPa)	600 psig (4.1 MPa)	900 psig (6.2 MPa)
Ambient and operating temperature	-10 to 71°C (No freezing) *1)					
Cv	0.3					
Leak rate	1 x 10 ⁻¹⁰ Pa·m ³ /s					
Connections	NPT female, Compression					
Installation	Bottom mount (Option: panel mount)					
Internal volume	0.49 in ³ (8 cm ³)					
Weight	1.2 kg *2)					

*1) Min. -30°C for PTFE seat. Optional ambient and operating temperature range available. Please contact SMC.

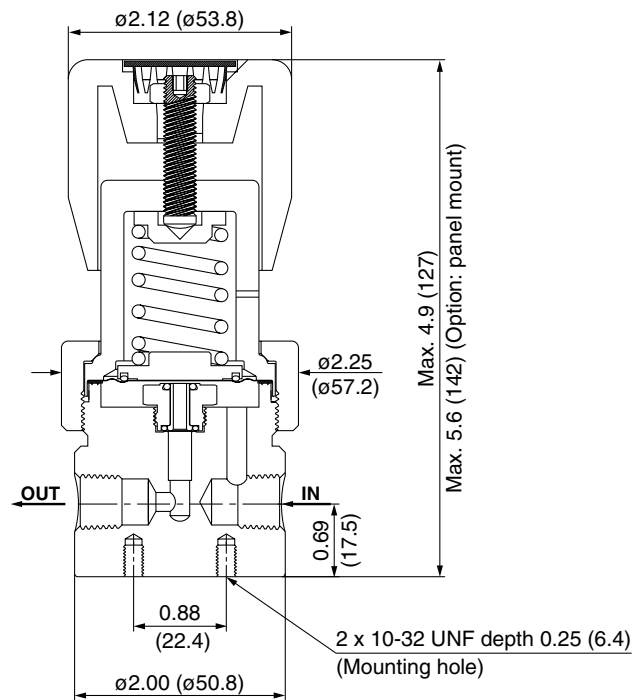
*2) Weight, including individual boxed weight, may vary depending on connections or options.

Wetted Parts Material

Wetted Parts	B	S	SH
Body	Brass	316 SS	
Diaphragm	316 SS		Ni-Cr-Mo alloy
Nozzle	316 SS		Ni-Cr-Mo alloy
Seat	FKM (Option: PTFE, FFKM)		
Seal	PTFE		

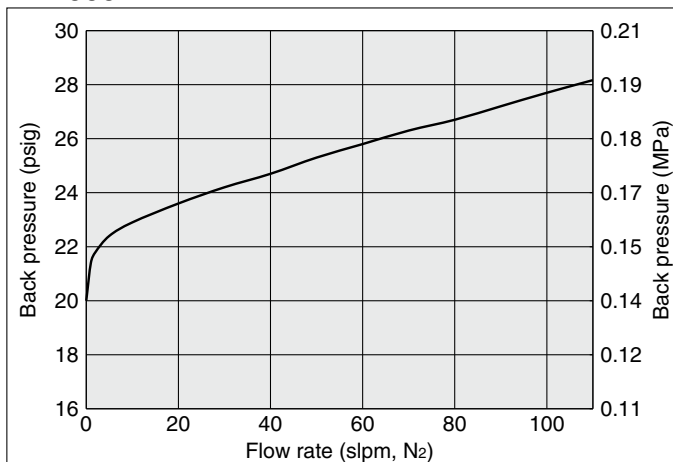
Dimensions

BP1000



Flow Characteristics

BP1000



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Welded Connection Series Back Pressure Regulator for Ultra High Purity

Series BP1000

- For UHP gas delivery
- Operating pressure: 0.5 to 300 psig (0.0034 to 2.1 MPa)
- Body material: 316L SS secondary remelt
- Ni-Cr-Mo alloy internals available for corrosion resistance



RoHS

How to Order

BP10 01 S 2PW FV4 FV4

Operating pressure

Code	Pressure
01	0.5 to 10 psig (0.0034 to 0.07 MPa)
02	1 to 30 psig (0.007 to 0.2 MPa)
10	5 to 100 psig (0.034 to 0.7 MPa)
20	15 to 200 psig (0.1 to 1.4 MPa)
30	15 to 300 psig (0.1 to 2.1 MPa)

Material

Code	Body	Nozzle	Diaphragm
S	316L SS		316L SS
SH	secondary remelt		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)

Connections (Inlet①, Outlet②)

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

Bonnet option

Code	Bonnet
No code	Standard
P	Panel installation *3)

*3) Panel mounting hole: dia. 1.42 inch (36.1 mm).

Seat material

Code	Material
No code	FKM (Standard)
TF	PTFE
KZ	FFKM

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Ports

Code	Ports
2PW	2 ports
3PW	3 ports

Porting Configuration

① IN ② OUT ③ Gauge port (Inlet)

Gauge port (Inlet③)

Code	Pressure gauge *1)
No code	No gauge port
0	No pressure gauge (Gauge port: 1/4 inch NPT)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
V2	-30 in.Hg to 200 psig -0.1 to 1.4 MPa
2	-30 in.Hg to 160 psig 0 to 1.4 MPa
4	0 to 400 psig 0 to 3 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Sample Order Number

BP10 01 S 2PW FV4 FV4 ③
3PW FV4 FV4 V3 MPA

Specifications

Operating Parameters		BP1001	BP1002	BP1010	BP1020	BP1030
Operating pressure		0.5 to 10 psig (0.0034 to 0.07 MPa)	1 to 30 psig (0.007 to 0.2 MPa)	5 to 100 psig (0.034 to 0.7 MPa)	15 to 200 psig (0.1 to 1.4 MPa)	15 to 300 psig (0.1 to 2.1 MPa)
Gas		Select compatible materials of construction for the gas				
Proof pressure (Inlet)		15 psig (0.105 MPa)	45 psig (0.3 MPa)	150 psig (1.05 MPa)	300 psig (2.1 MPa)	450 psig (3.15 MPa)
Burst pressure		30 psig (0.2 MPa)	90 psig (0.6 MPa)	300 psig (2.1 MPa)	600 psig (4.1 MPa)	900 psig (6.2 MPa)
Ambient and operating temperature		-10 to 71°C (No freezing) *1)				
Cv		0.3				
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s				
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s He				
Across the seat leak		Bubble tight				
Surface finish		Ra max x 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		0.49 in ³ (8 cm ³)				
Weight		1.2 kg *2)				

*1) Min. -30°C for PTFE seat. Optional ambient and operating temperature range available. Please contact SMC.

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

Welded Connection Series Back Pressure Regulator for Ultra High Purity **Series BP1000**

Wetted Parts Material

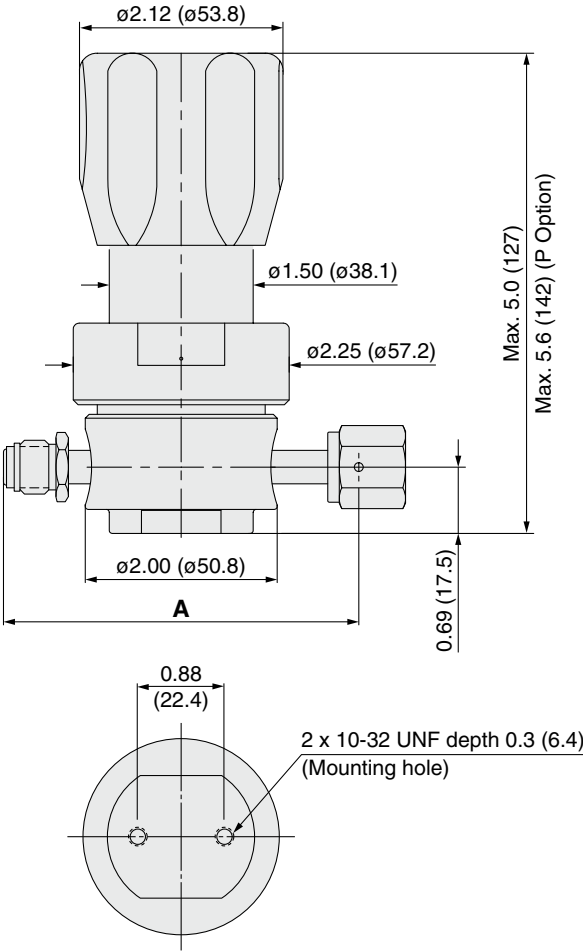
Wetted Parts	S	SH
Body	316L SS secondary remelt	
Diaphragm	316L SS	Ni-Cr-Mo alloy
Nozzle	316L SS	Ni-Cr-Mo alloy
Seat	FKM (Option: PTFE, FFKM)	
Seal	PTFE	

Dimensions

inch (mm)

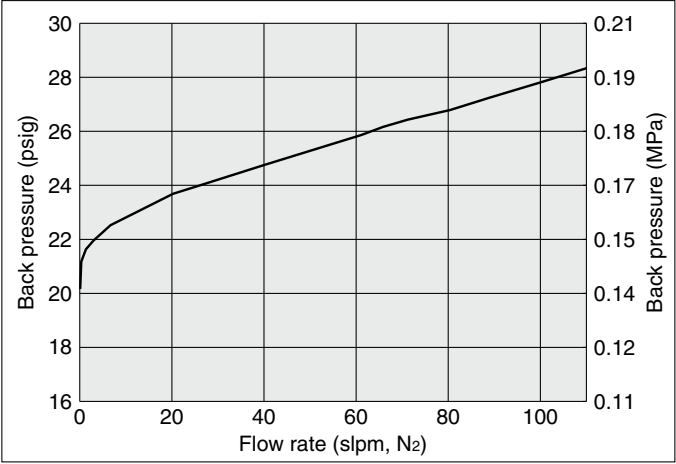
BP1000

Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4		
TW4	2.96	(75.2)
FV6	4.70	(119.4)
MV6		
TW6	2.96	(75.2)



Flow Characteristics

BP1000



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Recommendations
Regulators
AP
SL
AZ
AK
BP
Diaphragm Valves
Check Valves
Vacuum Generators
Flow Switches
Technical Data/ Glossary of Terms
Precautions

Series AP10PA

- Actuation control pressure isolated from process gas by two seals
- Body material: 316L SS secondary remelt
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity Standard: to 30 slpm
HF (option): to 120 slpm
- Ni-Cr-Mo alloy internals available for corrosion resistance
- 100 psig (0.69 MPa) outlet pressure achievable with 80 psig (0.55 MPa) control pressure or less



RoHS

How to Order

AP10 PA S 2PW FV4 FV4

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
PA	7 to 150 psig (0.05 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SHP	secondary remelt			
SH		Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	
H	Ni-Cr-Mo alloy			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
3PW	3 ports
4PW	4 ports

Connections (Inlet①, Outlet②)

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

Gauge port (Inlet③, Outlet④)

Code	Pressure gauge *1)
	psig/bar unit MPa unit
No code	No gauge port
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
2	0 to 200 psig 0 to 1.4 MPa
40	0 to 4000 psig 0 to 28 MPa

Option

Code	Specification
No code	Standard (Cv: 0.09)
HF	High flow (Cv: 0.15) *6)

*6) Full outlet pressure rating may not be achieved at all inlet pressure.

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide *3)
TF	PTFE *4) *5)

*3) Not available with SHP, SH, H materials.
*4) Source pressure rating is limited to 300 psig (2.1 MPa) or less.
*5) PTFE seats reduce seat abrasion for flow cycle application. Gas permeation is greater with PTFE than PCTFE.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration (Top view)

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Specifications

Operating Parameters		AP10PA
Delivery pressure		7 to 150 psig (0.05 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas
Source pressure		Vacuum to 3500 psig (24.1 MPa) *1)
Proof pressure (Inlet)		5000 psig (34.5 MPa)
Burst pressure		10000 psig (69 MPa)
Maximum control pressure		150 psig (1.0 MPa)
Ambient and operating temperature		-40 to 71°C (No freezing) *2)
Cv		0.09
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *3)
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *4)
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
Control pressure port		NPT 1/8 inch
Bonnet port		NPT 1/8 inch
Supply pressure effect		0.38 psig (0.0026 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation		Bottom mount
Internal volume		0.49 in ³ (8 cm ³)

*1) Max. 300 psig (2.1 MPa) for PTFE seat.

*2) Max. 90°C for Polyimide seat.

*3) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*4) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

Option

High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AP10PA
HF	Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa) *)
	Cv	0.15
	Supply pressure effect	0.75 psig (0.0052 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop

*) HF option will not achieve rated outlet pressure at all inlet pressures.

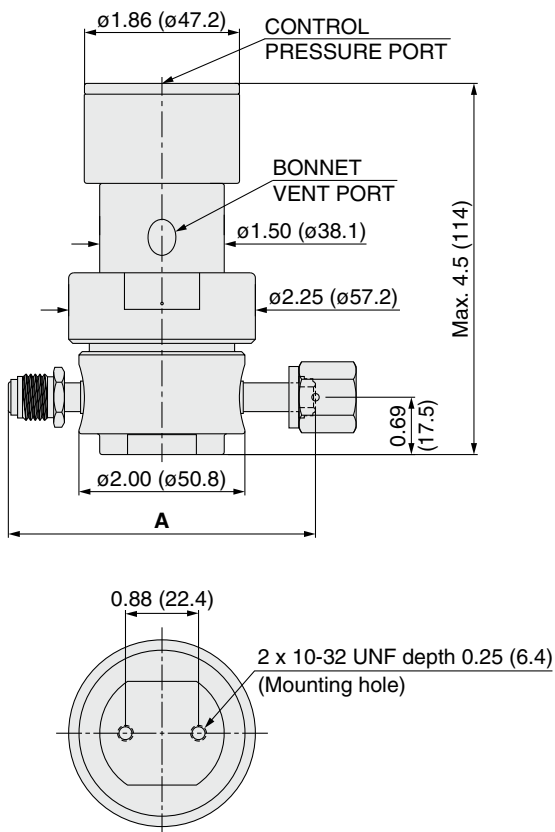
Wetted Parts Material

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

Dimensions

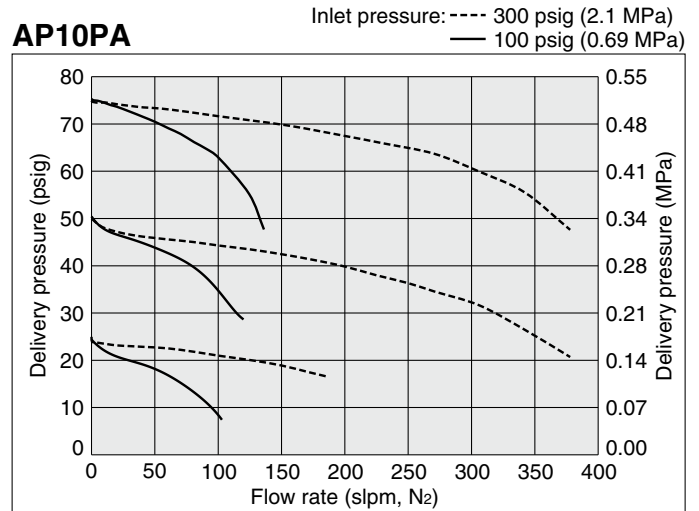
inch (mm)

AP10PA



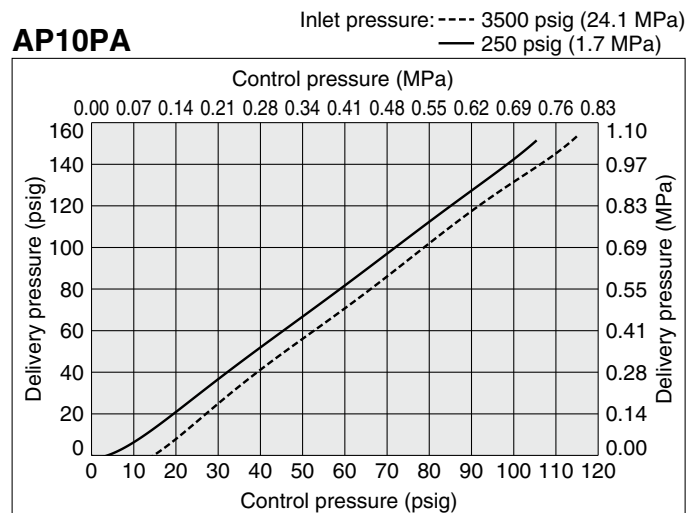
Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4	2.96	(75.2)
TW4	2.96	(75.2)
FV6	4.70	(119.4)
MV6	2.96	(75.2)
TW6	2.96	(75.2)

Flow Characteristics



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input/Output Characteristics



Series AP15PA

- Actuation control pressure isolated from process gas by two seals
- Body material: 316L SS secondary remelt
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity Standard: to 30 slpm
- Ni-Cr-Mo alloy internals available for corrosion resistance
- 100 psig (0.69 MPa) outlet pressure achievable with 800 psig (0.55 MPa) control pressure or less



RoHS

How to Order

AP15 PA S 2PW FV4 FV4

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
PA	7 to 150 psig (0.05 to 1.0MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SHP	secondary remelt	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy
SH	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
3PW	3 ports
4PW	4 ports

Connections (Inlet①, Outlet②)

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

Gauge port (Inlet③, Outlet④)

Code	Pressure gauge *1)
No code	No pressure gauge
0	No gauge port (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
2	0 to 200 psig 0 to 1.4 MPa
40	0 to 4000 psig 0 to 28 MPa

Seat material

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

*3) Not available with SHP, SH, H materials.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration (Top view)

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Specifications

Operating Parameters		AP15PA
Delivery pressure		7 to 150 psig (0.05 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas
Source pressure		Vacuum to 3500 psig (24.1 MPa)
Proof pressure (Inlet)		5000 psig (34.5 MPa)
Burst pressure		10000 psig (69 MPa)
Maximum control pressure		150 psig (1.0 MPa)
Ambient and operating temperature		-40 to 71°C (No freezing) *1)
Cv		0.09
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)
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
Control pressure port		NPT 1/8 inch
Bonnet port		NPT 1/8 inch
Supply pressure effect		0.41 psig (0.0028 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation		Bottom mount
Internal volume		0.51 in ³ (8.4 cm ³)

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*3) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

Pneumatic Actuation Pressure Regulator *Series AP15PA*

Low flow (Tied-diaphragm)

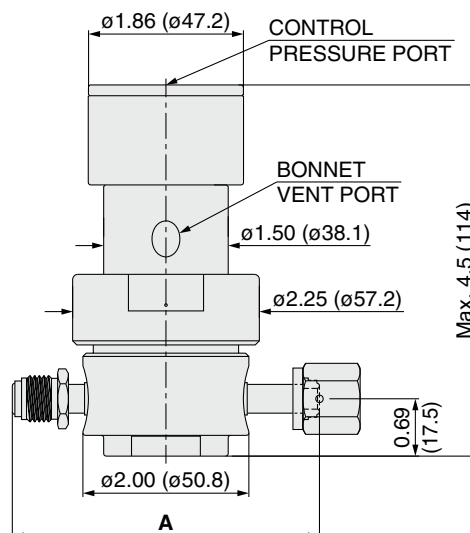
Wetted Parts Material

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

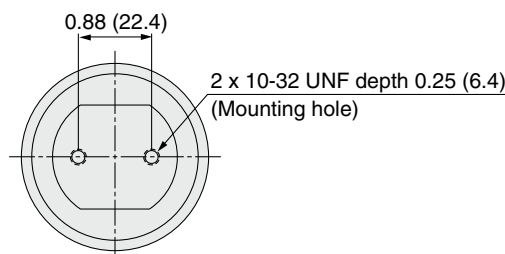
Dimensions

inch (mm)

AP15PA



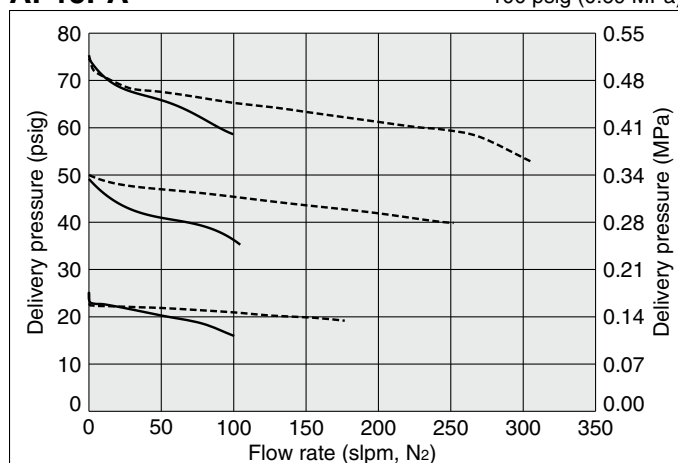
Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4	2.96	(75.2)
TW4	2.96	(75.2)
FV6	4.70	(119.4)
MV6	2.96	(75.2)
TW6	2.96	(75.2)



Flow Characteristics

AP15PA

Inlet pressure: ---- 300 psig (2.1 MPa)
— 100 psig (0.69 MPa)

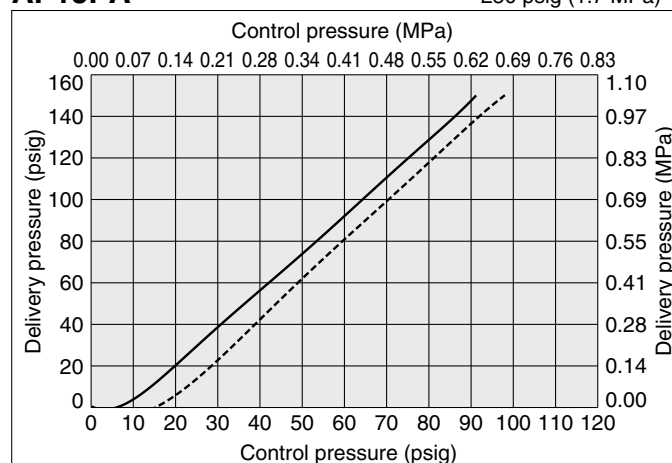


Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input / Output Characteristics

AP15PA

Inlet pressure: ---- 3500 psig (24.1 MPa)
— 250 psig (1.7 MPa)



Pneumatic Actuation Pressure Regulator

Intermediate flow
(Tied-diaphragm)

Series AP14PAT

- Actuation control pressure isolated from process gas by two seals
- Body material: 316L SS secondary remelt
- High inlet pressure type Standard: Max. 2300 psig (15.9 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity: to 400 slpm
- Ni-Cr-Mo alloy internals standard
- 100 psig (0.69 MPa) outlet pressure achievable with 80 psig (0.55 MPa) control pressure or less



RoHS

How to Order

AP14 PA T S **2PW** **FV4** **FV4**

Port Number ① ② ③ ④

Delivery pressure

Code	Delivery pressure
PA	7 to 150 psig (0.05 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	316L SS
SH	secondary remelt	alloy	alloy	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
3PW	3 ports
4PW	4 ports

Connections (Inlet①, Outlet②)

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
FV8	1/2 inch face seal (Female)
MV8	1/2 inch face seal (Male)
TW8	1/2 inch tube weld

Gauge port (Inlet③, Outlet④)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch face seal male)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
2	0 to 200 psig	0 to 1.4 MPa
40	0 to 4000 psig	0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications.
Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Option

Code	Specification
No code	Standard
HR	High inlet pressure *4) (Max. inlet pressure 3000 psig (20.7 MPa))

*4) Full outlet pressure rating may not be achieved at all inlet pressure.

Seat material

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

*3) Not available with SH material.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration(Top View)

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Specifications

Operating Parameters		AP14PAT
Delivery pressure		7 to 150 psig (0.05 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas
Source pressure		Vacuum to 2300 psig (15.9 MPa)
Proof pressure (Inlet)		4000 psig (27.6 MPa)
Burst pressure		8000 psig (55.2 MPa)
Maximum control pressure		150 psig (1.0 MPa)
Ambient and operating temperature		-40 to 71°C (No freezing) *1)
Cv		0.45
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)
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
Control pressure port		NPT 1/8 inch
Bonnet port		NPT 1/8 inch
Supply pressure effect		1.6 psig (0.011 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation		Bottom mount
Internal volume		1.06 in ³ (17.4 cm ³)

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*3) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

Option

High inlet pressure

Changes from the standard type are:

Option	Other Parameters	AP14PAT
HR	Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa) *)
	Source pressure	Vacuum to 3000 psig (20.7 MPa)
	Proof pressure (Inlet)	4500 psig (31 MPa)
	Burst pressure	9000 psig (62 MPa)

*) HR option will not achieve rated outlet pressure at all inlet pressures.

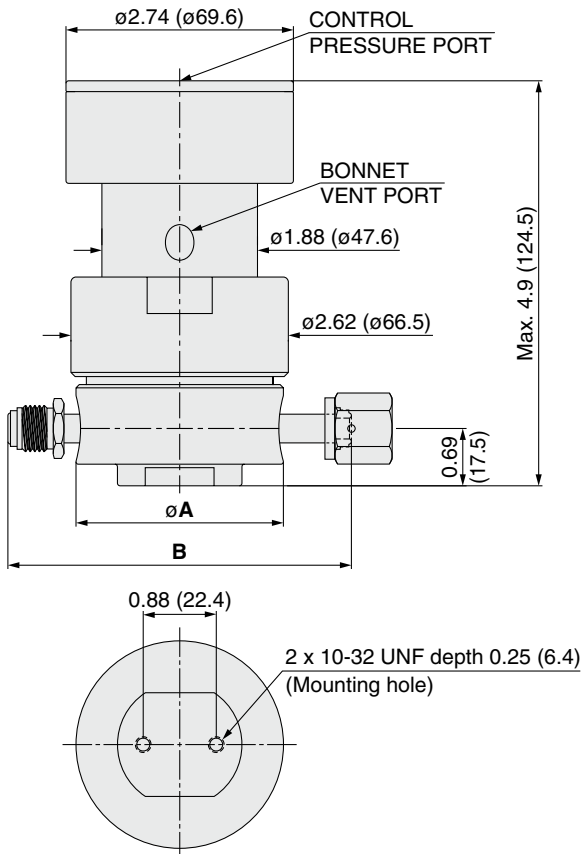
Wetted Parts Material

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

Dimensions

inch (mm)

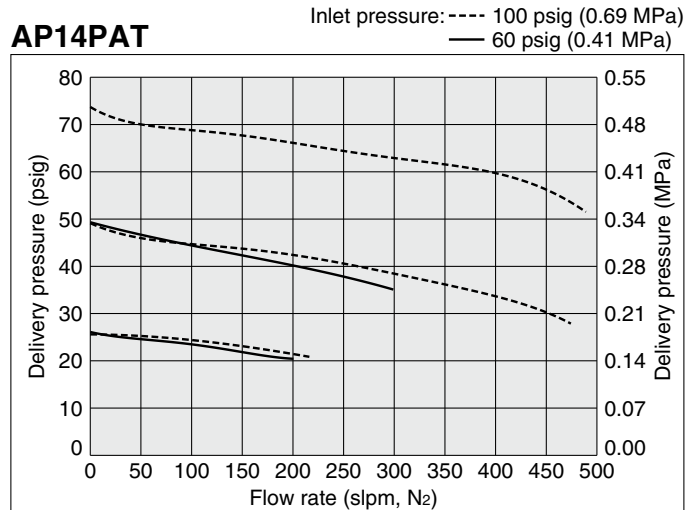
AP14PAT



Connections	A		B	
	inch	(mm)	inch	(mm)
FV4	2.00	(50.8)	3.70	(94.0)
MV4			4.00	(101.6)
TW4			3.46	(87.9)
FV6	2.50	(63.5)	5.22	(132.6)
MV6			4.00	(101.6)
TW6			5.22	(132.6)
FV8			5.22	(132.6)
MV8			4.34	(110.2)

Flow Characteristics

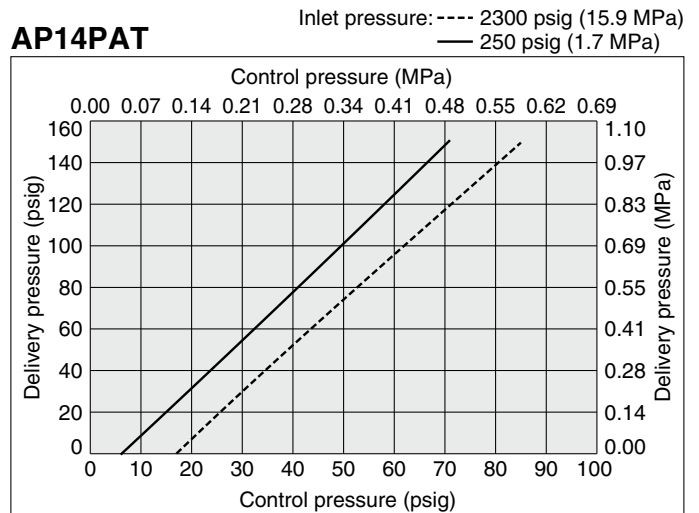
AP14PAT



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input / Output Characteristics

AP14PAT



Pneumatic Actuation Pressure Regulator

High flow
(Tied-diaphragm)

Series AP12PA

- Actuation control pressure isolated from process gas by two seals
- Body material: 316L SS secondary remelt
- High inlet pressure type Standard: Max. 1700 psig (11.7 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity Standard: to 800 slpm
HF (option): to 1000 slpm
- Ni-Cr-Mo alloy internals available for corrosion resistance
- 100 psig (0.69 MPa) outlet pressure achievable with 80 psig (0.55 MPa) control pressure or less



RoHS

How to Order

AP12 PA S **2PW** **FV8** **FV8**

Port Number ① ② ③ ④

Delivery pressure

Code	Delivery pressure
PA	7 to 150 psig (0.05 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	Ni-Cr-Mo alloy	316L SS
SHP	secondary remelt	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy
SH				

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
3PW	3 ports
4PW	4 ports

Connections (Inlet ①, Outlet ②)

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
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) *1)
MV12	3/4 inch face seal (Male) *1)
TW12	3/4 inch tube weld

*1) Prepare a suitable mating fitting with a rated pressure.

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *2)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch face seal male)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
2	0 to 200 psig	0 to 1.4 MPa
40	0 to 4000 psig	0 to 28 MPa

*2) Refer to gauge guide (P.115) for gauge specifications.
Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Option

Code	Specification
No code	Standard (Cv: 0.65)
HF	High flow (Cv: 1.1) *5)
HR	High inlet pressure *5) (Max. inlet pressure 3000 psig (20.7 MPa))

*5) Full outlet pressure rating may not be achieved at all inlet pressure.

Seat material

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

*4) Not available with SHP and SH materials.

Pressure gauge unit *3)

Code	Unit
No code	psig/bar
MPA	MPa

*3) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration (Top View)

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Specifications

Operating Parameters		AP12PA
Delivery pressure		7 to 150 psig (0.05 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas
Source pressure		Vacuum to 1700 psig (11.7 MPa)
Proof pressure (Inlet)		2550 psig (17.6 MPa)
Burst pressure		8000 psig (55.2 MPa)
Maximum control pressure		150 psig (1.0 MPa)
Ambient and operating temperature		-40 to 71°C (No freezing) *1)
Cv		0.65
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)
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
Control pressure port		NPT 1/8 inch
Bonnet port		NPT 1/8 inch
Supply pressure effect		3.5 psig (0.024 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation		Bottom mount
Internal volume		1.20 in ³ (19.6 cm ³)

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*3) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

Options

1. High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AP12PA
HF	Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa) *)
	Cv	1.1
	Supply pressure effect	4.2 psig (0.029 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop

2. High inlet pressure

Changes from the standard type are:

Option	Other Parameters	AP12PA
HR	Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa) *)
	Source pressure	Vacuum to 3000 psig (20.7 MPa)
	Proof pressure (Inlet)	4500 psig (31 MPa)
	Burst pressure	9000 psig (62 MPa)

*) HF and HR option will not achieve rated outlet pressure at all inlet pressures.

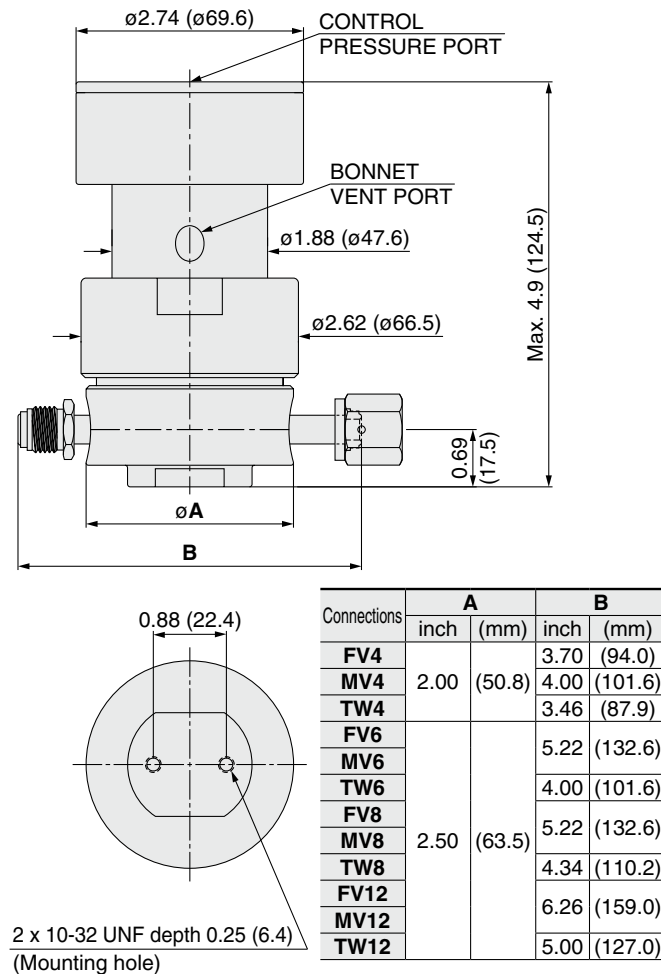
Wetted Parts Material

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

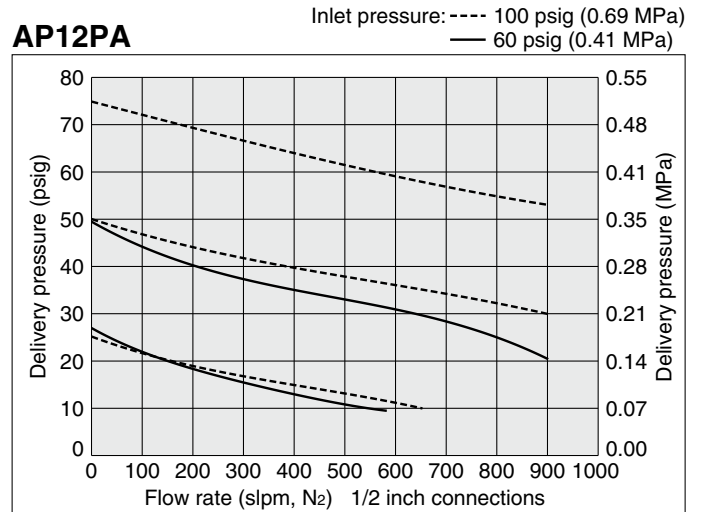
Dimensions

inch (mm)

AP12PA

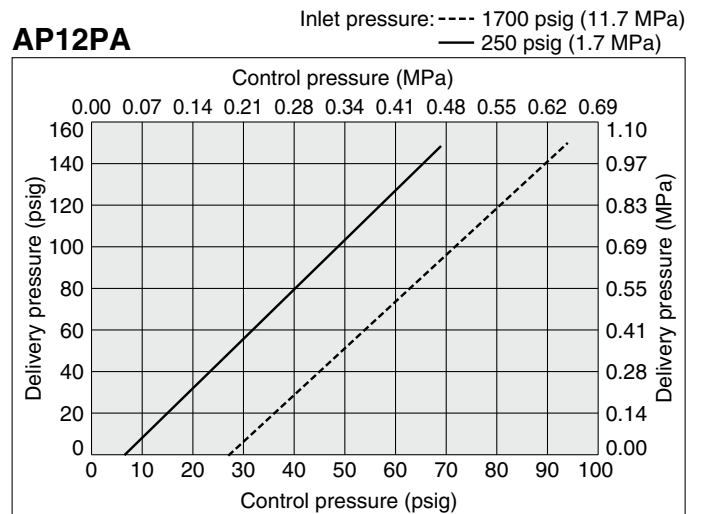


Flow Characteristics



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input / Output Characteristics



Series AZ10PA



RoHS

- Actuation control pressure isolated from process gas by two seals
- Body material: 316L SS
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity Standard: to 30 slpm
HF (option): to 120 slpm
- Ni-Cr-Mo alloy internals available for corrosion resistance
- 100 psig (0.69 MPa) outlet pressure achievable with 80 psig (0.55 MPa) control pressure or less

How to Order

AZ10 PA S 2PW FV4 FV4

Port Number ① ② ③ ④

Delivery pressure

Code	Delivery pressure
PA	7 to 150 psig (0.05 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SHP	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	316L SS

Surface finish

Code	Surface finish Ra
No code	10 μin. (0.25 μm) Standard
Q	25 μin. (0.62 μm)

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

Connections (Inlet①, Outlet②)

Code	Connections
FV4	1/4 inch face seal (Female)
MV4	1/4 inch face seal (Male)
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	Standard (Cv: 0.09)
HF	High flow (Cv: 0.15) *6)

*6) Full outlet pressure rating may not be achieved at all inlet pressure.

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide *3)
TF	PTFE *4)*5)

*3) Not available with SHP material.
*4) PTFE recommended for applications such as within a process tool.
*5) Source pressure rating is limited to 300 psig (2.1 MPa) or less.

Gauge port (Inlet③, Outlet④)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch face seal male)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration (Top View)

①IN ②OUT ③Gauge port (Inlet) ④Gauge port (Outlet)

Specifications

Operating Parameters		AZ10PA
Delivery pressure		7 to 150 psig (0.05 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas
Source pressure		Vacuum to 3500 psig (24.1 MPa) *1)
Proof pressure (Inlet)		5000 psig (34.5 MPa)
Burst pressure		10000 psig (69 MPa)
Maximum control pressure		150 psig (1.0 MPa)
Ambient and operating temperature		-40 to 71°C (No freezing) *2)
Cv		0.09
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *3)
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *4)
Surface finish		Ra 10 μin. (0.25 μm) Option: 25 μin. (0.62 μm)
Connections		Face seal, Tube weld
Control pressure port		NPT 1/8 inch
Bonnet port		NPT 1/8 inch
Supply pressure effect		0.38 psig (0.0026 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation		Bottom mount
Internal volume		0.49 in ³ (8 cm ³)

*1) Max. 300 psig (2.1 MPa) for PTFE seat.

*2) Max. 90°C for Polyimide seat.

*3) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*4) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

Option

High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AZ10PA
HF	Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa) *)
	Cv	0.15
	Supply pressure effect	0.75 psig (0.0052 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop

*) HF option will not achieve rated outlet pressure at all inlet pressures.

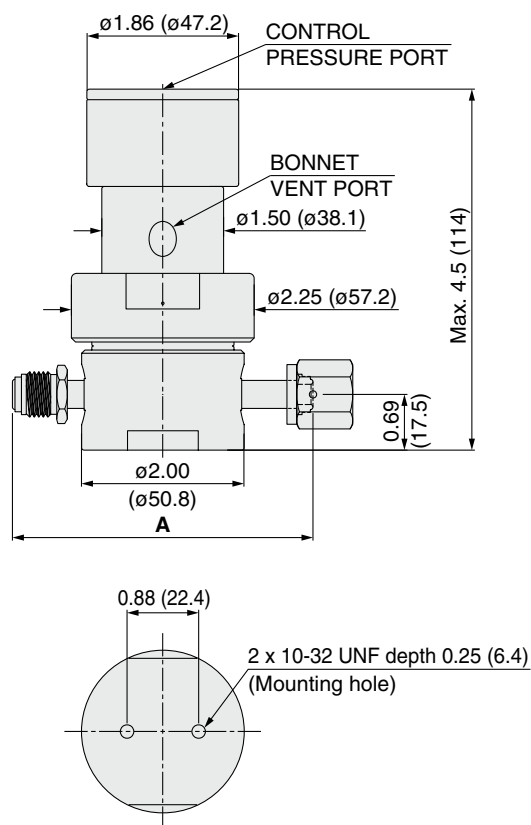
Wetted Parts Material

Wetted Parts	S	SHP
Body	316L SS	
Surface finish	Electropolish + Passivation	
Poppet	316L SS	Ni-Cr-Mo alloy
Diaphragm	316L SS	Ni-Cr-Mo alloy
Nozzle	316L SS	
Seat	PCTFE (Option: Polyimide, PTFE)	PCTFE (Option: PTFE)

Dimensions

inch (mm)

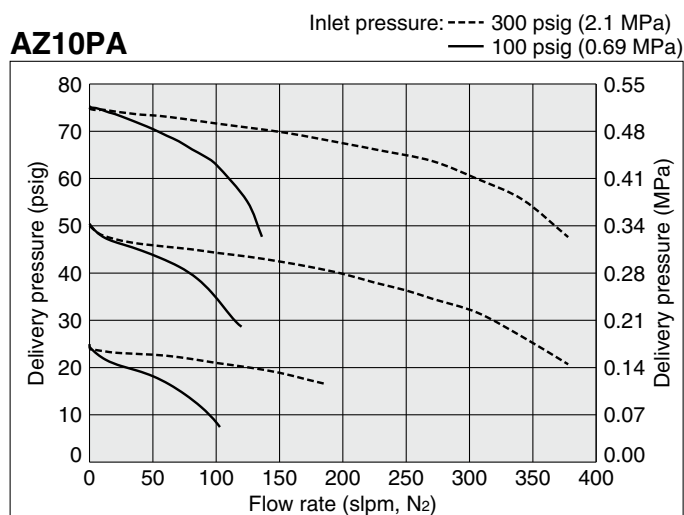
AZ10PA



Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4	3.70	(94.0)
FV6	4.70	(119.4)
MV6	4.70	(119.4)
TW6	2.96	(75.2)

Flow Characteristics

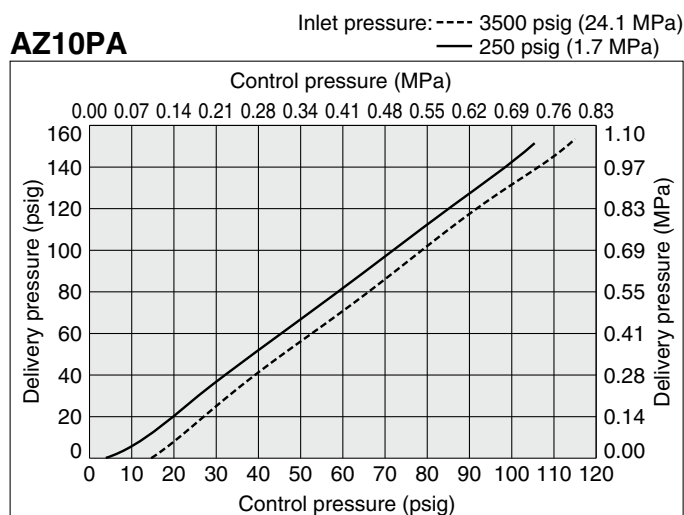
AZ10PA



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input / Output Characteristics

AZ10PA



Pneumatic Actuation Pressure Regulator

Low flow
(Tied-diaphragm)

Series AZ15PA



RoHS

- Actuation control pressure isolated from process gas by two seals
- Body material: 316L SS secondary remelt
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity Standard: to 30 slpm
- Ni-Cr-Mo alloy internals available for corrosion resistance
- 100 psig (0.69 MPa) outlet pressure achievable with 80 psig (0.55 MPa) control pressure or less

How to Order

AZ15 PA S **2PW** **FV4** **FV4** **1** **2** **3** **4**

Delivery pressure

Code	Delivery pressure
PA	7 to 150 psig (0.05 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS	316L SS	316L SS	316L SS
SHP		Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	

Surface finish

Code	Surface finish Ra
No code	10 μ m. (0.25 μ m) Standard
Q	25 μ m. (0.62 μ m)

Seat material

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

*3) Not available with SHP material.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration (Top View)

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

Connections (Inlet ①, Outlet ②)

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

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch face seal male)	
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
2	-30 in.Hg to 160 psig	0 to 1.4 MPa
40	0 to 4000 psig	0 to 28 MPa

*1) Other range available. Refer to gauge guide (P.115). Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Specifications

Operating Parameters		AZ15PA
Delivery pressure		7 to 150 psig (0.05 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas
Source pressure		Vacuum to 3500 psig (24.1 MPa)
Proof pressure (Inlet)		5000 psig (34.5 MPa)
Burst pressure		10000 psig (69 MPa)
Maximum control pressure		150 psig (1.0 MPa)
Ambient and operating temperature		-40 to 71°C (No freezing) *1)
Cv		0.09
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)
Surface finish		Ra 10 μ m. (0.25 μ m) Option: 25 μ m. (0.62 μ m)
Connections		Face seal, Tube weld
Control pressure port		NPT 1/8 inch
Bonnet port		NPT 1/8 inch
Supply pressure effect		0.41 psig (0.0028 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation		Bottom mount
Internal volume		0.51 in ³ (8.4 cm ³)

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*3) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

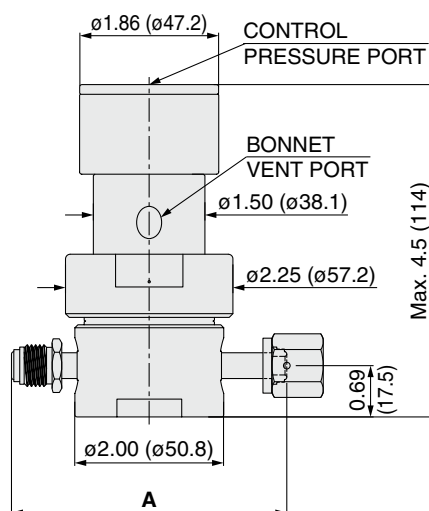
Wetted Parts Material

Wetted Parts	S	SHP
Body	316L SS	
Surface finish	Electropolish + Passivation	
Poppet	316L SS	Ni-Cr-Mo alloy
Diaphragm	316L SS	Ni-Cr-Mo alloy
Nozzle	316L SS	
Seat	PCTFE (Option: Polyimide)	PCTFE

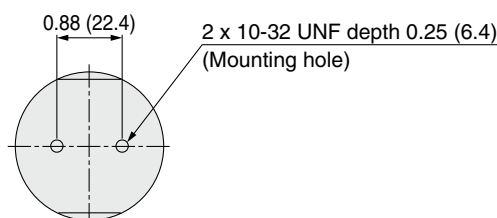
Dimensions

inch (mm)

AZ15PA



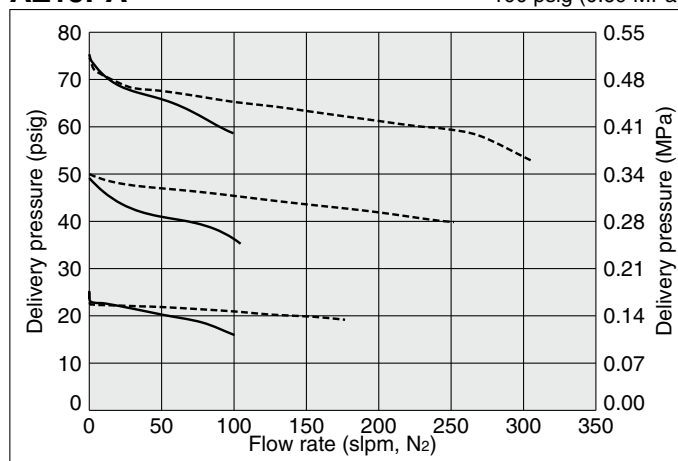
Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4	3.70	(94.0)
FV6	4.70	(119.4)
MV6	4.70	(119.4)
TW6	2.96	(75.2)



Flow Characteristics

AZ15PA

Inlet pressure: ---- 300 psig (2.1 MPa)
— 100 psig (0.69 MPa)

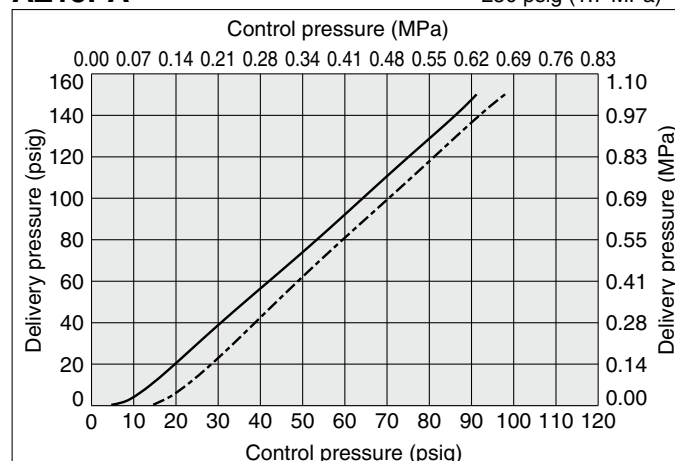


Note) slpm, N2: The volumetric flow rate under normal conditions (0°C, 1 atm) when N2 gas is flowing.

Input / Output Characteristics

AZ15PA

Inlet pressure: --- 3500 psig (24.1 MPa)
— 250 psig (1.7 MPa)



Pneumatic Actuation Pressure Regulator

Intermediate flow
(Tied-diaphragm)

Series AZ14PAT

- Actuation control pressure isolated from process gas by two seals
- Body material: 316 SS secondary remelt
- High inlet pressure type Standard: Max. 2300 psig (15.9 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity: to 400 slpm
- Ni-Cr-Mo alloy internals standard
- 100 psig (0.69 MPa) outlet pressure achievable with
80 psig (0.55 MPa) control pressure or less



RoHS

How to Order

AZ14 PA T S **2PW** **FV4** **FV4**

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
PA	7 to 150 psig (0.05 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm
S	316L SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy

Surface finish

Code	Surface finish Ra
No code	10 μin. (0.25 μm) Standard
Q	25 μin. (0.62 μm)

Connections (Inlet ①, Outlet ②)

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

Option

Code	Specification
No code	Standard
HR	High inlet pressure *3) (Max. inlet pressure 3000 psig (20.7 MPa))

*3) Full outlet pressure rating may not be achieved at all inlet pressure.

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *1)
No code	No gauge port
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
2	0 to 200 psig 0 to 1.4 MPa
40	0 to 4000 psig 0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications.
Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Porting Configuration (Top View)

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

Specifications

Operating Parameters		AZ14PAT
Delivery pressure		7 to 150 psig (0.05 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas
Source pressure		Vacuum to 2300 psig (15.9 MPa)
Proof pressure (Inlet)		4000 psig (27.6 MPa)
Burst pressure		8000 psig (55.2 MPa)
Maximum control pressure		150 psig (1.0 MPa)
Ambient and operating temperature		-40 to 71°C (No freezing) *1)
Cv		0.45
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)
Surface finish		Ra 10 μin. (0.25 μm) Option: 25 μin. (0.62 μm)
Connections		Face seal, Tube weld
Control pressure port		NPT 1/8 inch
Bonnet port		NPT 1/8 inch
Supply pressure effect		1.6 psig (0.011 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation		Bottom mount
Internal volume		1.06 in ³ (17.4 cm ³)

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*3) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

Option

High inlet pressure

Changes from the standard type are:

Option	Other Parameters	AZ14PAT
HR	Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa) *)
	Source pressure	Vacuum to 3000 psig (20.7 MPa)
	Proof pressure (Inlet)	4500 psig (31 MPa)
	Burst pressure	9000 psig (62 MPa)

*) HR option will not achieve rated outlet pressure at all inlet pressures.

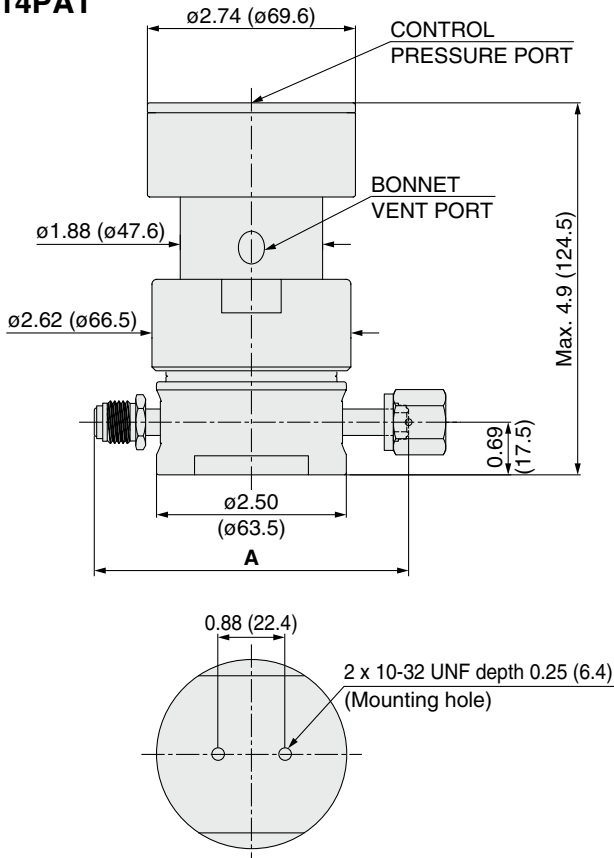
Wetted Parts Material

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

Dimensions

inch (mm)

AZ14PAT

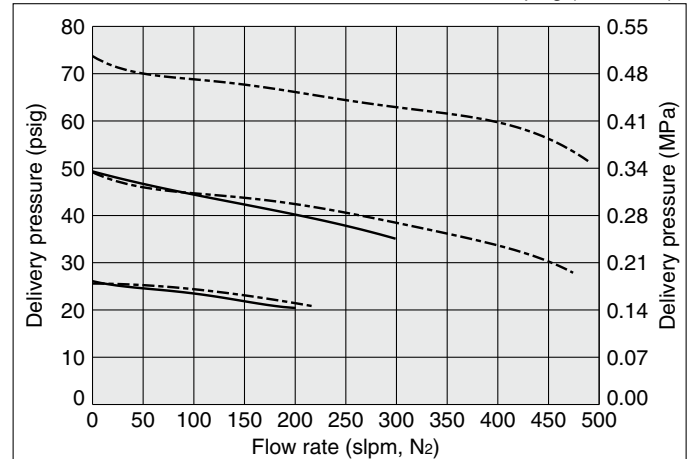


Connections	A	
	inch	(mm)
FV4 MV4	4.30	(109.2)
FV6 MV6	5.22	(132.6)
TW6	4.00	(101.6)
FV8 MV8	5.22	(132.6)
TW8	4.34	(110.2)

Flow Characteristics

AZ14PAT

Inlet pressure: --- 100 psig (0.69 MPa)
— 60 psig (0.41 MPa)

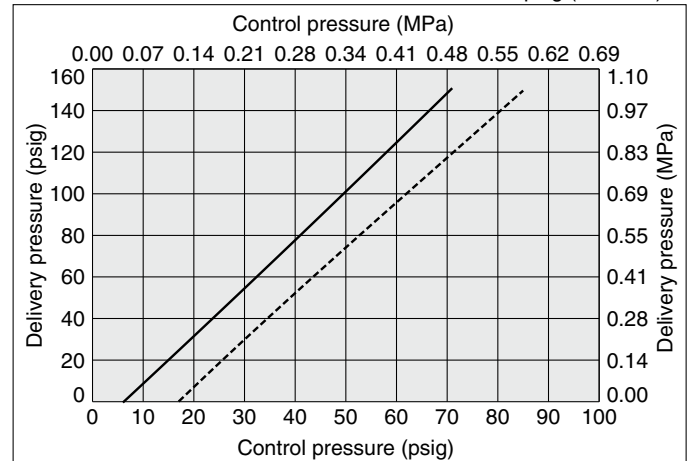


Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input / Output Characteristics

AZ14PAT

Inlet pressure: ---- 2300 psig (15.9 MPa)
— 250 psig (1.7 MPa)



Pneumatic Actuation Pressure Regulator

High flow
(Tied-diaphragm)

Series AZ12PA

- Actuation control pressure isolated from process gas by two seals
- Body material: 316L SS
- High inlet pressure type Standard: Max. 1700 psig (11.7 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity Standard: to 800 slpm
HF (option): to 1000 slpm
- Ni-Cr-Mo alloy internals available for corrosion resistance
- 100 psig (0.69 MPa) outlet pressure achievable with 80 psig (0.55 MPa) control pressure or less



RoHS

How to Order

AZ12 PA S 2PW FV8 FV8

Port Number
① ② ③ ④

Delivery pressure

Code	Delivery pressure
PA	7 to 150 psig (0.05 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm
S	316L SS	316L SS	Ni-Cr-Mo alloy
SHP		Ni-Cr-Mo alloy	Ni-Cr-Mo alloy

Surface finish

Code	Surface finish Ra
No code	10 μin. (0.25 μm) Standard
Q	25 μin. (0.62 μm)

Connections (Inlet ①, Outlet ②)

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

Option

Code	Specification
No code	Standard (Cv: 0.65)
HF	High flow (Cv: 1.1) *4)
HR	High inlet pressure *4) (Max. inlet pressure 3000 psig (20.7 MPa))

*4) Full outlet pressure rating may not be achieved at all inlet pressure.

Seat material

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

*3) Not available with SHP material.

Ports

Code	Ports
2PW	2 ports
3PW	3 ports
4PW	4 ports

Gauge port (Inlet ③, Outlet ④)

Code	Pressure gauge *1)
No code	No gauge port
0	No pressure gauge (Connections: 1/4 inch face seal male)
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
2	-30 in.Hg to 160 psig 0 to 1.4 MPa
40	0 to 4000 psig 0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Porting Configuration (Top View)

① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet)

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Specifications

Operating Parameters		AZ12PA
Delivery pressure		7 to 150 psig (0.05 to 1.0 MPa)
Gas		Select compatible materials of construction for the gas
Source pressure		Vacuum to 1700 psig (11.7 MPa)
Proof pressure (Inlet)		2550 psig (17.6 MPa)
Burst pressure		8000 psig (55.2 MPa)
Maximum control pressure		150 psig (1.0 MPa)
Ambient and operating temperature		-40 to 71°C (No freezing) *1)
Cv		0.65
Leak rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s
	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *2)
Across the seat leak		4 x 10 ⁻⁹ Pa·m ³ /s *3)
Surface finish		Ra 10 μin. (0.25 μm) Option: 25 μin. (0.62 μm)
Connections		Face seal, Tube weld
Control pressure port		NPT 1/8 inch
Bonnet port		NPT 1/8 inch
Supply pressure effect		3.5 psig (0.024 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation		Bottom mount
Internal volume		1.20 in ³ (19.6 cm ³)

*1) Max. 90°C for Polyimide seat.

*2) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*3) Tested with Helium gas inlet pressure 1000 psig (7 MPa).

Options

1. High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AZ12PA
HF	Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa) *)
	Cv	1.1
	Supply pressure effect	4.2 psig (0.029 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop

2. High inlet pressure

Changes from the standard type are:

Option	Other Parameters	AZ12PA
HR	Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa) *)
	Source pressure	Vacuum to 3000 psig (20.7 MPa)
	Proof pressure (Inlet)	4500 psig (31 MPa)
	Burst pressure	9000 psig (62 MPa)

*) HF and HR option will not achieve rated outlet pressures at all inlet pressures.

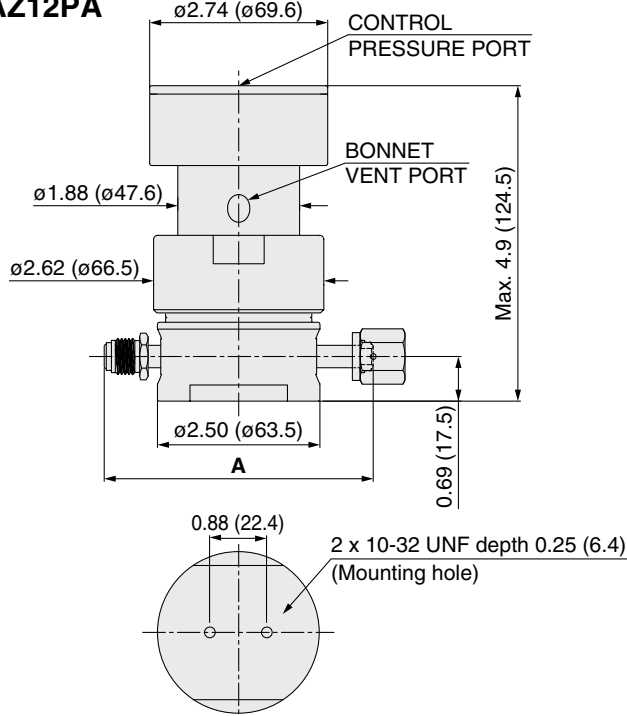
Wetted Parts Material

Wetted Parts	S	SHP
Body	316L SS	
Surface finish	Electropolish + Passivation	
Poppet	316L SS	Ni-Cr-Mo alloy
Diaphragm	Ni-Cr-Mo alloy	
Nozzle	316L SS	
Seat	PCTFE (Option: Polyimide)	PCTFE

Dimensions

inch (mm)

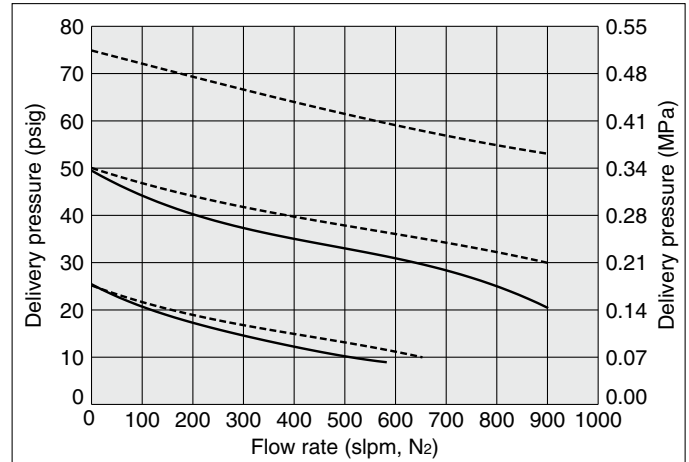
AZ12PA



Connections	A	
	inch	(mm)
FV4 MV4	4.30	(109.2)
FV6 MV6	5.22	(132.6)
TW6	4.00	(101.6)
FV8 MV8	5.22	(132.6)
TW8	4.34	(110.2)

Flow Characteristics

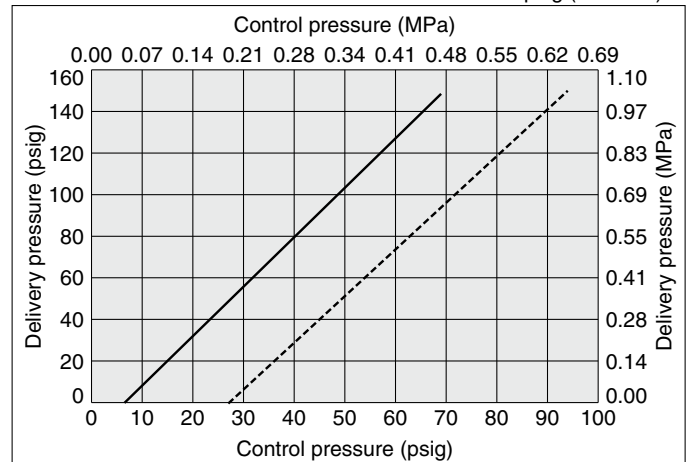
AZ12PA Inlet pressure: ---- 100 psig (0.69 MPa) — 60 psig (0.41 MPa)
1/2 inch connections



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input / Output Characteristics

AZ12PA Inlet pressure: ---- 1700 psig (11.7 MPa) — 250 psig (1.7 MPa)



Series AK10PA

- Actuation control pressure isolated from process gas by two seals
- Body material: 316 SS
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity Standard: to 30 slpm
HF (option): to 120 slpm
- Ni-Cr-Mo alloy internals available for corrosion resistance
- 100 psig (0.69 MPa) outlet pressure achievable with 80 psig (0.55 MPa) control pressure or less



RoHS

How to Order

AK10 PA S 4PL 4 4 0 0 0 0 0 0

Delivery pressure

Code	Delivery pressure
PA	7 to 150 psig (0.05 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm
B	Brass	316 SS	316 SS
S	316 SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy
SH	316 SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy

Ports

Code	Ports	Material		
		B	S	SH
2P	Refer to the following porting configurations.		●	
3P			●	
4P			●	
4PL		●	●	
5PC		●	●	●

Connections (Inlet①, Outlet②)

Code	Connections
4	NPT 1/4 inch
4T	1/4 inch compression
6T	3/8 inch compression

Option

Code	Specification
No code	Standard (Cv: 0.09)
HF	High flow (Cv: 0.15) *6)

*6) Full outlet pressure rating may not be achieved at all inlet pressure.

Seat material

Code	Material
No code	PCTFE (Standard)
VS	Polyimide *3)
PK	PEEK
TF	PTFE *4) *5)

*3) Not available with SH material.
*4) Source pressure rating is limited to 300 psig (2.1 MPa) or less.
*5) PTFE seats reduce seat abrasion for flow cycle application. Gas permeation is greater with PTFE than PCTFE.

Gauge port (Extra bottom outlet③, Inlet④, Outlet⑤)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Gauge port: 1/4 inch NPT) *2)	
C	No pressure gauge (1/4 inch NPT plug is installed before shipment.)	
V15	-30 in.Hg to 30 psig	-0.1 to 0.1 MPa
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
V2	-30 in.Hg to 200 psig	-0.1 to 1.4 MPa
2	-30 in.Hg to 160 psig	0 to 1.5 MPa
4	0 to 400 psig	0 to 3 MPa
10	0 to 1000 psig	0 to 7 MPa
30	0 to 3000 psig	0 to 21 MPa
40	0 to 4000 psig	0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.
*2) 1/4 inch NPT plug is included only for port code 4PL and 5PC.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Porting Configuration (Top View)

① IN ② OUT ③ Extra bottom port (Outlet) ④ Gauge port (Inlet) ⑤ Gauge port (Outlet)

Specifications

Operating Parameters	AK10PA
Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa)
Gas	Select compatible materials of construction for the gas
Source pressure	Vacuum to 3500 psig (24.1 MPa) *1)
Proof pressure (Inlet)	4500 psig (30.7 MPa)
Burst pressure	10000 psig (69 MPa)
Maximum control pressure	150 psig (1.0 MPa)
Ambient and operating temperature	-40 to 71°C (No freezing) *2)
Cv	0.09
Leak rate	1 x 10 ⁻¹⁰ Pa·m ³ /s
Connections	NPT female, Compression
Control pressure port	NPT 1/8 inch
Bonnet port	NPT 1/8 inch
Supply pressure effect	0.38 psig (0.0026 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation	Bottom mount
Internal volume	0.49 in ³ (8 cm ³)

*1) Max. 300 psig (2.1 MPa) for PTFE seat.

*2) Max. 90°C for Polyimide and PEEK seat. Optional ambient and operating temperature range available. Please contact SMC.

Option

High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AK10PA
HF	Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa) *)
	Cv	0.15
	Supply pressure effect	0.75 psig (0.0052 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop

*) HF option will not achieve rated outlet pressure at all inlet pressures.

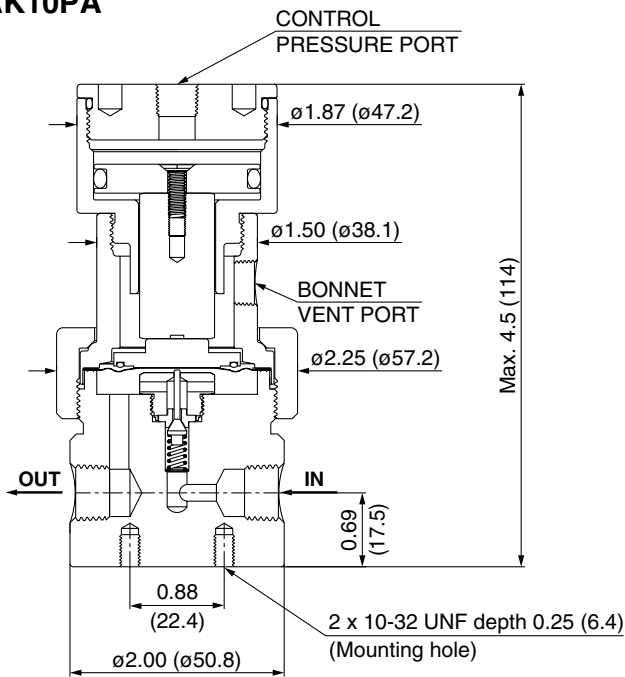
Wetted Parts Material

Wetted Parts	B	S	SH
Body	Brass	316 SS	
Poppet	316 SS		Ni-Cr-Mo alloy
Diaphragm	316 SS		Ni-Cr-Mo alloy
Seat	PCTFE (Option: Polyimide, PEEK, PTFE)		PCTFE (Option: PEEK, PTFE)

Dimensions

inch (mm)

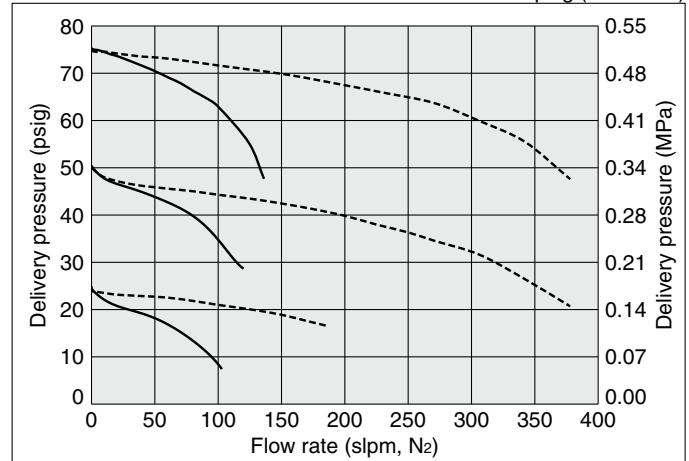
AK10PA



Flow Characteristics

AK10PA

Inlet pressure: ---- 300 psig (2.1 MPa)
— 100 psig (0.69 MPa)

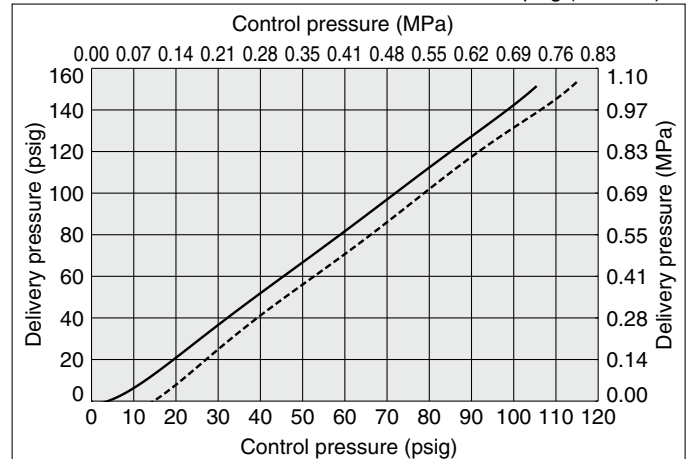


Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input / Output Characteristics

AK10PA

Inlet pressure: ---- 3500 psig (24.1 MPa)
— 250 psig (1.7 MPa)



Series AK15PA

- Actuation control pressure isolated from process gas by two seals
- Body material: 316L SS secondary remelt
- High inlet pressure type: Max. 3500 psig (24.1 MPa)
- Flow capacity Standard: to 30 slpm
- Ni-Cr-Mo alloy internals available for corrosion resistance
- 100 psig (0.69 MPa) outlet pressure achievable with 80 psig (0.55 MPa) control pressure or less



RoHS

How to Order

AK15 PA S 4PL 4 4 0 0 0 0

Port Number ① ② ③ ④ ⑤

Delivery pressure

Code	Delivery pressure
PA	7 to 150 psig (0.05 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm
B	Brass	316 SS	316 SS
S	316 SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy
SH	316 SS	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy

Connections (Inlet①, Outlet②)

Code	Connections
4	NPT 1/4 inch
4T	1/4 inch compression
6T	3/8 inch compression

Seat material

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

*3) Not available with SH material.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Ports

Code	Ports	Material
		B, S, SH
2P	Refer to the following porting configurations.	●
3P		●
4PL		●
5PC		●

Porting Configuration (Top View)

① IN ② OUT ③ Extra bottom port (Outlet)
④ Gauge port (Inlet) ⑤ Gauge port (Outlet)

Gauge port (Extra bottom outlet③, Inlet④, Outlet⑤)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Gauge port: 1/4 inch NPT) *2)	
C	No pressure gauge (1/4 inch NPT plug is installed before shipment.)	
V15	-30 in.Hg to 30 psig	-0.1 to 0.1 MPa
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
V2	-30 in.Hg to 200 psig	-0.1 to 1.4 MPa
2	-30 in.Hg to 160 psig	0 to 1.5 MPa
4	0 to 400 psig	0 to 3 MPa
10	0 to 1000 psig	0 to 7 MPa
30	0 to 3000 psig	0 to 21 MPa
40	0 to 4000 psig	0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.
*2) 1/4 inch NPT plug is included only for port code 4PL and 5PC.

Specifications

Operating Parameters	AK15PA
Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa)
Gas	Select compatible materials of construction for the gas
Source pressure	Vacuum to 3500 psig (24.1 MPa)
Proof pressure (Inlet)	4500 psig (30.7 MPa)
Burst pressure	10000 psig (69 MPa)
Maximum control pressure	150 psig (1.0 MPa)
Ambient and operating temperature	-40 to 71°C (No freezing) *)
Cv	0.09
Leak rate	1 x 10 ⁻¹⁰ Pa·m ³ /s
Connections	NPT female, Compression
Control pressure port	NPT 1/8 inch
Bonnet port	NPT 1/8 inch
Supply pressure effect	0.41 psig (0.0028 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation	Bottom mount
Internal volume	0.53 in ³ (8.7 cm ³)

*) Max. 90°C for Polyimide and PEEK seat. Optional ambient and operating temperature range available. Please contact SMC.

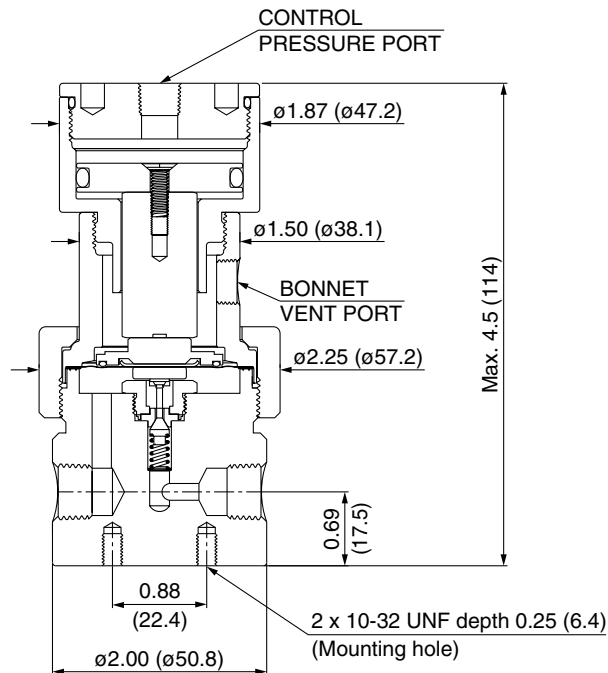
Wetted Parts Material

Wetted Parts	B	S	SH
Body	Brass	316 SS	
Poppet		316 SS	Ni-Cr-Mo alloy
Diaphragm		316 SS	Ni-Cr-Mo alloy
Seat	PCTFE (Option: Polyimide, PEEK)		PCTFE (Option: PEEK)

Dimensions

inch (mm)

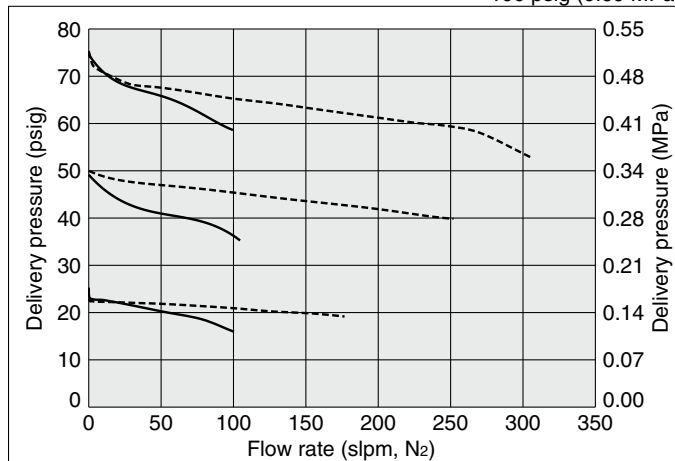
AK15PA



Flow Characteristics

AK15PA

Inlet pressure: ---- 300 psig (2.1 MPa)
— 100 psig (0.69 MPa)

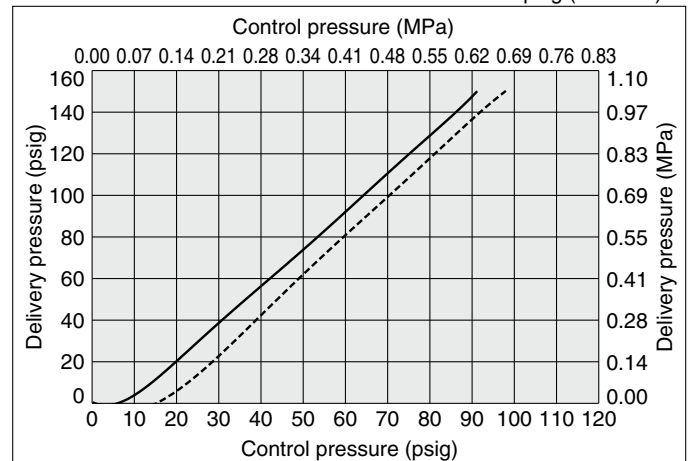


Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input/Output Characteristics

AK15PA

Inlet pressure: ---- 3500 psig (24.1 MPa)
— 250 psig (1.7 MPa)



Recommendations

Regulators

AP

SL

AZ

AK

BP

Diaphragm Valves

Check Valves

Vacuum Generators

Flow Switches

Technical Data/
Glossary of Terms

Precautions

Pneumatic Actuation Pressure Regulator

Intermediate flow
(Tied-diaphragm)

Series AK14PAT

- Actuation control pressure isolated from process gas by two seals
- Body material: 316 SS
- High inlet pressure type Standard: Max. 2300 psig (15.9 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity: to 400 slpm
- Ni-Cr-Mo alloy internals standard
- 100 psig (0.69 MPa) outlet pressure achievable with 80 psig (0.55 MPa)



RoHS

How to Order

AK14 PA T S 4PL 6 6 0 0 0

Delivery pressure

Code	Delivery pressure
PA	7 to 150 psig (0.05 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm	Nozzle
B	Brass	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	316 SS
S	316 SS			Ni-Cr-Mo alloy
SH				

Ports

Code	Ports	Material
2P	Refer to the following porting configurations.	B, S, SH
3P		B, S, SH
4PL		B, S, SH
5PC		B, S, SH

Porting Configuration (Top View)

Connections (Inlet①, Outlet②)

Code	Connections
4	NPT 1/4 inch
6	NPT 3/8 inch
8	NPT 1/2 inch
4T	1/4 inch compression
6T	3/8 inch compression
8T	1/2 inch compression

Option

Code	Specification
No code	Standard
HR	High inlet pressure *4) (Max. inlet pressure 3000 psig (20.7 MPa))

*4) Full outlet pressure rating may not be achieved at all inlet pressure.

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Seat material

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

*3) Not available with SH material.

Gauge port (Extra bottom outlet③, Inlet④, Outlet⑤)

Code	Pressure gauge *1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Gauge port: 1/4 inch NPT) *2)	
C	No pressure gauge (1/4 inch NPT plug is installed before shipment.)	
V15	-30 in.Hg to 30 psig	-0.1 to 0.1 MPa
V3	-30 in.Hg to 30 psig	-0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig	-0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig	-0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig	-0.1 to 1.1 MPa
V2	-30 in.Hg to 200 psig	-0.1 to 1.4 MPa
2	-30 in.Hg to 160 psig	0 to 1.5 MPa
4	0 to 400 psig	0 to 3 MPa
10	0 to 1000 psig	0 to 7 MPa
30	0 to 3000 psig	0 to 21 MPa
40	0 to 4000 psig	0 to 28 MPa

Specifications

Operating Parameters	AK14PAT
Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa)
Gas	Select compatible materials of construction for the gas
Source pressure	Vacuum to 2300 psig (15.9 MPa)
Proof pressure (Inlet)	4000 psig (27.6 MPa)
Burst pressure	8000 psig (55.2 MPa)
Maximum control pressure	150 psig (1.0 MPa)
Ambient and operating temperature	-40 to 71°C (No freezing) *)
Cv	0.45
Leak rate	1 x 10 ⁻¹⁰ Pa·m ³ /s
Connections	NPT female, Compression
Control pressure port	NPT 1/8 inch
Bonnet port	NPT 1/8 inch
Supply pressure effect	1.6 psig (0.011 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation	Bottom mount
Internal volume	1.14 in ³ (18.7 cm ³)

*) Max. 90°C for Polyimide seat.

Pneumatic Actuation Pressure Regulator *Series AK14PAT*

Intermediate flow (Tied-diaphragm)

Option

High inlet pressure

Changes from the standard type are:

Option	Other Parameters	AK14PAT
HR	Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa) *)
	Source pressure	Vacuum to 3000 psig (20.7 MPa)
	Proof pressure (Inlet)	4500 psig (31 MPa)
	Burst pressure	9000 psig (62 MPa)

*) HR option will not achieve rated outlet pressure at all inlet pressures.

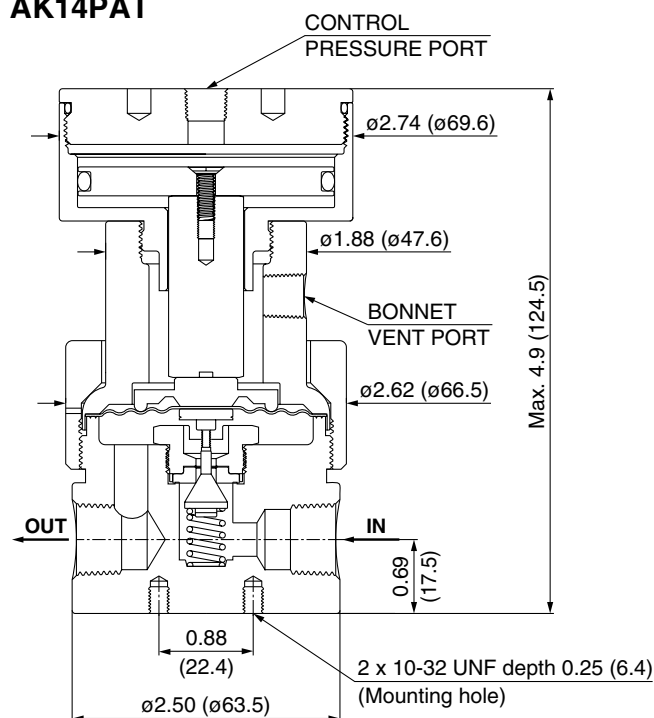
Wetted Parts Material

Wetted Parts	B	S	SH
Body	Brass	316 SS	
Poppet	Ni-Cr-Mo alloy		
Diaphragm	Ni-Cr-Mo alloy		
Nozzle	316 SS		Ni-Cr-Mo alloy
Seat	PCTFE (Option: Polyimide)		PCTFE

Dimensions

inch (mm)

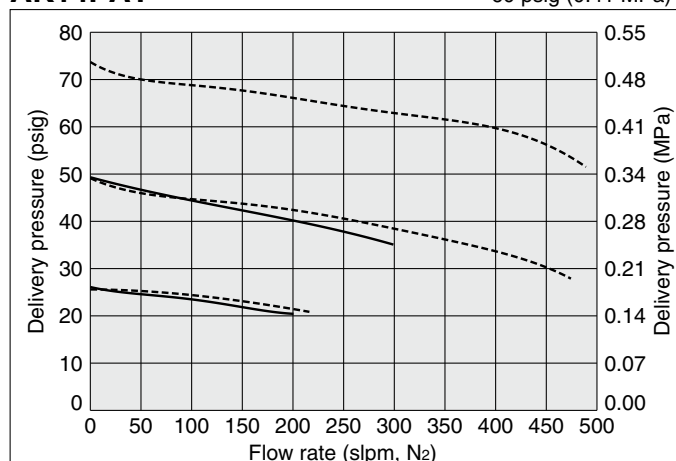
AK14PAT



Flow Characteristics

AK14PAT

Inlet pressure: ---- 100 psig (0.69 MPa)
— 60 psig (0.41 MPa)

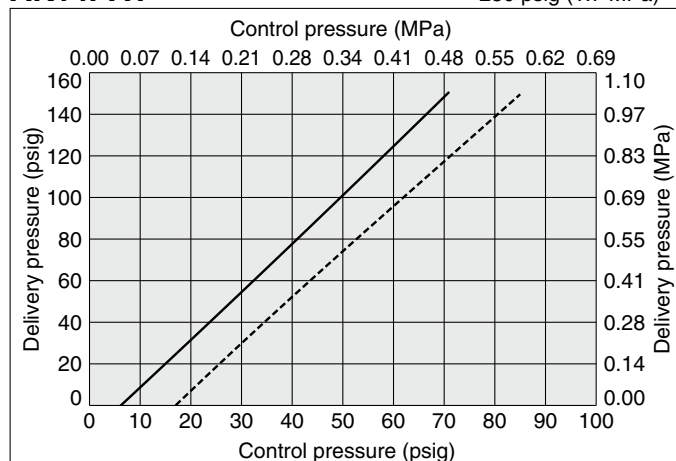


Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input/Output Characteristics

AK14PAT

Inlet pressure: ---- 2300 psig (15.9 MPa)
— 250 psig (1.7 MPa)



Series AK12PA

- Actuation control pressure isolated from process gas by two seals
- Body material: 316 SS
- High inlet pressure type Standard: Max. 1700 psig (11.7 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity Standard: to 800 slpm
HF (option): to 1000 slpm
- Ni-Cr-Mo alloy internals available for corrosion resistance
- 100 psig (0.69 MPa) outlet pressure achievable with 80 psig (0.55 MPa) control pressure or less



RoHS

How to Order

AK12 PA S 4PL 8 8 0 0 0 0 0 0

Delivery pressure

Code	Delivery pressure
PA	7 to 150 psig (0.05 to 1.0 MPa)

Material

Code	Body	Poppet	Diaphragm
B	Brass	316 SS	Ni-Cr-Mo alloy
S	316 SS		
SH		Ni-Cr-Mo alloy	

Ports

Code	Ports	Material
		B S, SH
2P		
3P	Refer to the following porting configurations.	
4PL		
5PC		

Porting Configuration (Top View)

Connections (Inlet ①, Outlet ②)

Code	Connections
4	NPT 1/4 inch
6	NPT 3/8 inch
8	NPT 1/2 inch
4T	1/4 inch compression
6T	3/8 inch compression
8T	1/2 inch compression

Pressure gauge unit *2)

Code	Unit
No code	psig/bar
MPA	MPa

*2) Pressure gauge unit MPa or psig/bar selectable. However under Japanese regulation, only MPa is available in Japan.

Option

Code	Specification
No code	Standard (Cv: 0.65)
HF	High flow (Cv: 1.1) *4)
HR	High inlet pressure *4) (Max. inlet pressure 3000 psig (20.7 MPa))

*4) Full outlet pressure rating may not be achieved at all inlet pressure.

Seat material

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

*3) Not available with SH material.

Gauge port (Extra bottom outlet ③, Inlet ④, Outlet ⑤)

Code	Pressure gauge *1)
	psig/bar unit MPa unit
No code	No gauge port
0	No pressure gauge (Gauge port: 1/4 inch NPT) *2)
C	No pressure gauge (1/4 inch NPT plug is installed before shipment.)
V15	-30 in.Hg to 30 psig -0.1 to 0.1 MPa
V3	-30 in.Hg to 30 psig -0.1 to 0.2 MPa
L	-30 in.Hg to 60 psig -0.1 to 0.4 MPa
1	-30 in.Hg to 100 psig -0.1 to 0.7 MPa
H	-30 in.Hg to 160 psig -0.1 to 1.1 MPa
V2	-30 in.Hg to 200 psig -0.1 to 1.4 MPa
2	-30 in.Hg to 160 psig 0 to 1.5 MPa
4	0 to 400 psig 0 to 3 MPa
10	0 to 1000 psig 0 to 7 MPa
30	0 to 3000 psig 0 to 21 MPa
40	0 to 4000 psig 0 to 28 MPa

*1) Refer to gauge guide (P.115) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.
*2) 1/4 inch NPT plug is included only for port code 4PL and 5PC.

Specifications

Operating Parameters	AK12PA
Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa)
Gas	Select compatible materials of construction for the gas
Source pressure	Vacuum to 1700 psig (11.7 MPa)
Proof pressure (Inlet)	2550 psig (17.6 MPa)
Burst pressure	8000 psig (55.2 MPa)
Maximum control pressure	150 psig (1.0 MPa)
Ambient and operating temperature	-40 to 71°C (No freezing) *)
Cv	0.65
Leak rate	1 x 10 ⁻¹⁰ Pa·m ³ /s
Connections	NPT female, Compression
Control pressure port	NPT 1/8 inch
Bonnet port	NPT 1/8 inch
Supply pressure effect	3.5 psig (0.024 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation	Bottom mount
Internal volume	1.32 in ³ (21.6 cm ³)

*) Max. 90°C for Polyimide seat. Optional ambient and operating temperature range available. Please contact SMC.

Options

1. High flow

Higher flow capacity with internal changes only, no change in external dimensions. Changes from the standard type are:

Option	Other Parameters	AK12PA
HF	Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa) *)
	Cv	1.1
	Supply pressure effect	4.2 psig (0.029 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop

2. High inlet pressure

Changes from the standard type are:

Option	Other Parameters	AK12PA
HR	Delivery pressure	7 to 150 psig (0.05 to 1.0 MPa) *)
	Source pressure	Vacuum to 3000 psig (20.7 MPa)
	Proof pressure (Inlet)	4500 psig (31 MPa)
	Burst pressure	9000 psig (62 MPa)

*) HR and HF options will not achieve rated outlet pressure at all inlet pressures.

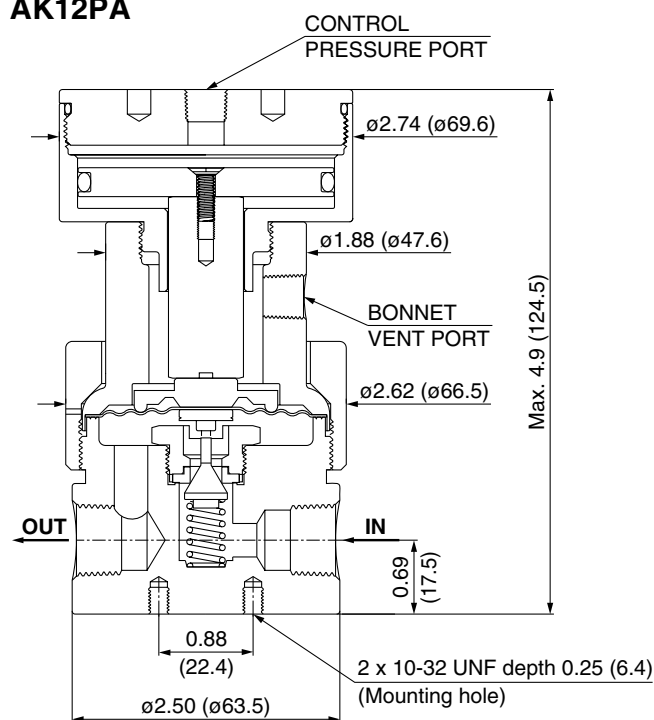
Wetted Parts Material

Wetted Parts	B	S	SH
Body	Brass	316 SS	
Poppet		316 SS	Ni-Cr-Mo alloy
Diaphragm			Ni-Cr-Mo alloy
Seat	PCTFE (Option: Polyimide)		PCTFE

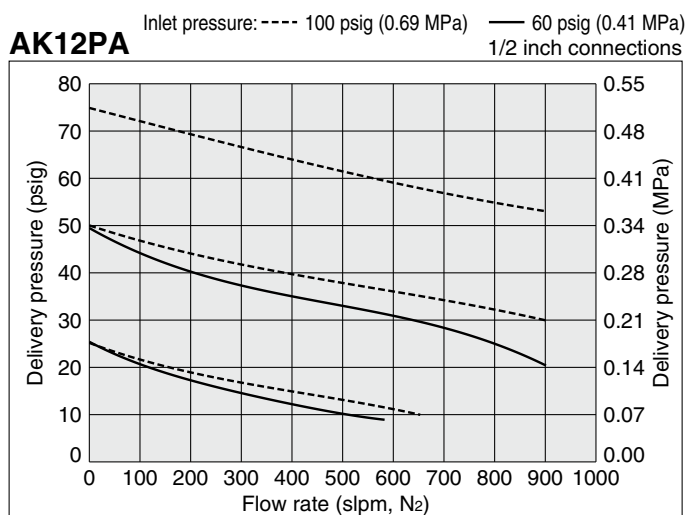
Dimensions

inch (mm)

AK12PA

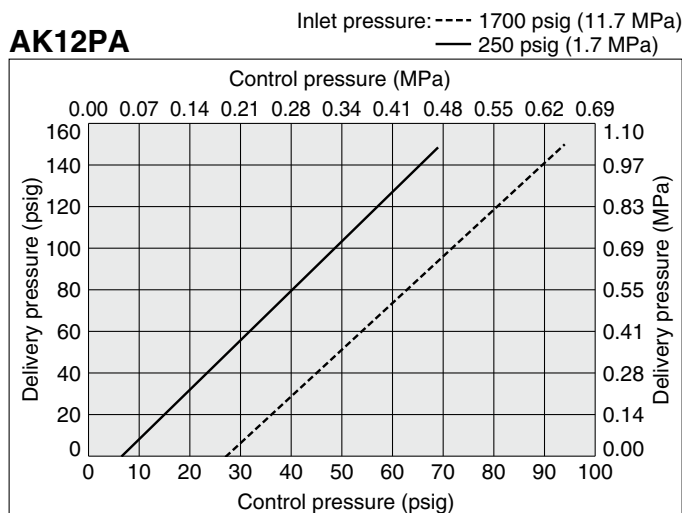


Flow Characteristics



Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input/Output Characteristics



Regulator Pressure Gauges Guide

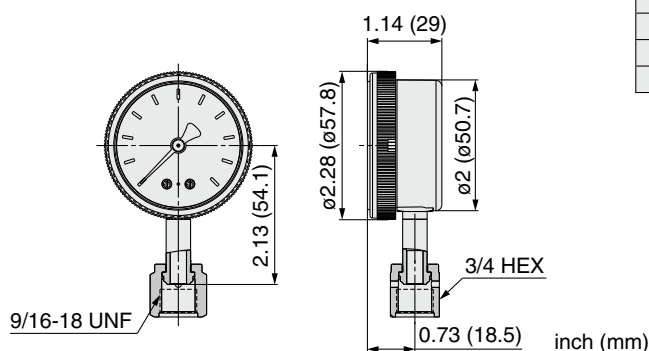
For AP/SL/AZ series (Installed before shipment ^{*1)} / Order separately)

Specifications

Installation		Lower mount
Gas		Select compatible materials of construction for the gas
Connections		1/4 inch face seal (Female)
Temperature range		-40 to 60°C (No freezing)
Accuracy		25% to 75% of the scale: ±1%F.S. Other than above: ±2%F.S. (ASME B40.1 Grade A)
Cleanliness		ASME B40.1 level IV
No oil		No oil
Material	Case	Stainless steel
	Window	Polycarbonate
	Socket	316L SS
	Bourdon tube	316L SS

Model

Regulator Code ^{*2)}		Pressure range	Unit	Part number ^{*3)}
gauge port	unit			
V3	(No code)	-30 in.Hg to 30 psig	psig/bar ^{*4)}	00-83000023
L		-30 in.Hg to 60 psig		00-83000026
1		-30 in.Hg to 100 psig		00-83000021
H		-30 in.Hg to 160 psig		00-83000116
2		0 to 200 psig		00-83000020
4		0 to 400 psig		00-83000007
10		0 to 1000 psig		00-83000022
40		0 to 4000 psig		00-83000024
V3	MPA	-0.1 to 0.2 MPa	MPa	00-83000304
L		-0.1 to 0.4 MPa		00-83000305
1		-0.1 to 0.7 MPa		00-83000300
H		-0.1 to 1.1 MPa		00-83000297
2		0 to 1.4 MPa		00-83000299
4		0 to 3 MPa		00-83000301
10		0 to 7 MPa		00-83000302
40		0 to 28 MPa		00-83000303



For AK/BP series (Installed before shipment / Order separately)

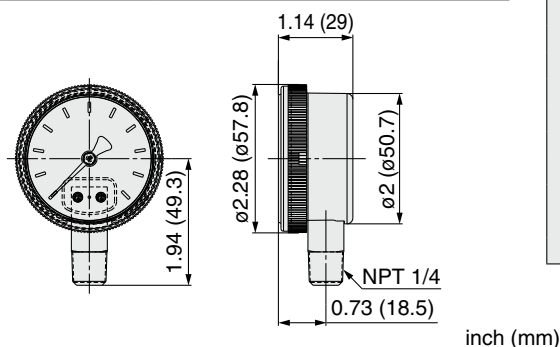
Stainless steel / Lower mount

Specifications

Installation		Lower mount
Gas		Select compatible materials of construction for the gas
Connections		NPT 1/4 inch
Temperature range		-40 to 60°C (No freezing)
Accuracy		25% to 75% of the scale: ±2%F.S. Other than above: ±3%F.S. (ASME B40.1 Grade B or better)
Cleanliness		ASME B40.1 level IV
No oil		No oil
Material	Case	Stainless steel
	Window	Polycarbonate
	Socket	316L SS
	Bourdon tube	316L SS

Model

Regulator Code ^{*2)}		Pressure range	Unit	Part number ^{*3)}
material	gauge port			
S SH	V15	-30 in.Hg to 15 psig	psig/bar ^{*4)}	00-83000102
	V3	-30 in.Hg to 30 psig		00-83000184
	L	-30 in.Hg to 60 psig		00-83000181
	1	-30 in.Hg to 100 psig		00-83000182
	H	-30 in.Hg to 160 psig		00-83000196
	V2	-30 in.Hg to 200 psig		00-83000033
	2	0 to 200 psig		00-83000193
	4	0 to 400 psig		00-83000194
	10	0 to 1000 psig	MPa	00-83000187
	30	0 to 3000 psig		00-83000234
	40	0 to 4000 psig		00-83000183
	V15	-0.1 to 0.1 MPa		00-83000287
	V3	-0.1 to 0.2 MPa		00-83000288
	L	-0.1 to 0.4 MPa		00-83000289
	1	-0.1 to 0.7 MPa		00-83000290
	H	-0.1 to 1.1 MPa		00-83000291
	V2	-0.1 to 1.4 MPa	MPa	00-83000292
	2	0 to 1.5 MPa		00-83000286
	4	0 to 3 MPa		00-83000285
	10	0 to 7 MPa		00-83000284
	30	0 to 21 MPa		00-83000283
	40	0 to 28 MPa		00-83000282



*1) If one prefers shipment with the pressure gauges installed on the regulator, the material of gasket to be used on the connections will be Nickel (no plated). Please contact SMC for details if one prefers changing this material.

*2) When pressure gauge needs to be assembled with regulator when shipment, put this code as gauge port in How to Order.

Regulator / Pressure Gauges Guide

For AK/BP series (Installed before shipment / Order separately)

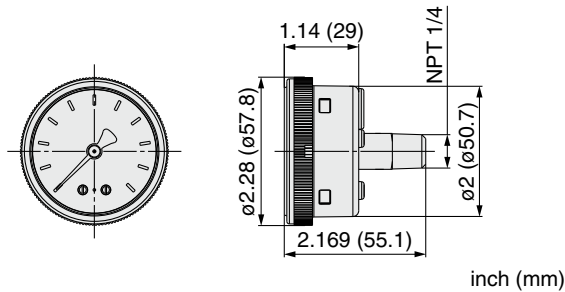
Stainless steel / Center back mount

Specifications

Installation		Center back mount
Gas		Select compatible materials of construction for the gas
Connections		NPT 1/4 inch
Temperature range		-40 to 60°C (No freezing)
Accuracy		25% to 75% of the scale: ±2%F.S. Other than above: ±3%F.S. (ASME B40.1 Grade B or better)
Cleanliness		ASME B40.1 level IV
No oil		No oil
Material	Case	Stainless steel
	Window	Polycarbonate
	Socket	316L SS
	Bourdon tube	316L SS

Model

Regulator Code	Pressure range	Unit	Part number *3)
*5)	-30 in.Hg to 100 psig	psig/bar *4)	00-83000224
	-30 in.Hg to 160 psig		00-83000272
	-0.1 to 0.7 MPa	MPa	00-83000293
	-0.1 to 1.1 MPa		00-83000294



inch (mm)

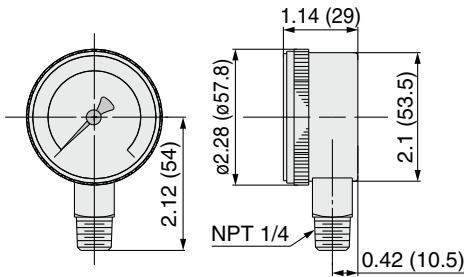
Brass / Lower mount

Specifications

Installation		Lower mount
Gas		Select compatible materials of construction for the gas
Connections		NPT 1/4 inch
Temperature range		-40 to 60°C (No freezing)
Accuracy		25% to 75% of the scale: ±2%F.S. Other than above: ±3%F.S. (ASME B40.1 Grade B or better)
Cleanliness		ASME B40.1 level IV
No oil		No oil
Material	Case	Brass or Stainless steel + ZrN Coating
	Window	Polycarbonate
	Socket	Brass
	Bourdon tube	Phosphor bronze

Model

Regulator Code *2)			Pressure range	Unit	Part number *3)
material	gauge port	unit			
B	V3	(No code)	-30 in.Hg to 30 psig	psig/bar *4)	00-83000265
	L		-30 in.Hg to 60 psig		00-83000177
	1		-30 in.Hg to 100 psig		00-83000178
	H		-30 in.Hg to 160 psig		00-83000239
	2		0 to 200 psig		00-83000218
	4		0 to 400 psig		00-83000205
	10	MPA	0 to 1000 psig	MPa	00-83000186
	40		0 to 4000 psig		00-83000179
	V3		-0.1 to 0.2 MPa		00-83000278
	L		-0.1 to 0.4 MPa		00-83000279
	1		-0.1 to 0.7 MPa		00-83000280
	H		-0.1 to 1.1 MPa		00-83000281
	2		0 to 1.5 MPa		00-83000277
	4		0 to 3 MPa		00-83000276
	10		0 to 7 MPa		00-83000275
	40		0 to 28 MPa		00-83000274



inch (mm)

*3) Part number of pressure gauge itself. Gauge are shipped separately.

*4) Under Japanese regulation, psig/bar unit gauge is not sold in Japan.

*5) Available for special order. Please contact SMC.



Process Gas Equipment/Regulator Specific Product Precautions

Be sure to read this before handling. Refer to the back cover for Safety Instructions and pages 166 and 167 and the Operation Manual for common precautions.
<http://www.smcworld.com>

Selection

Warning

1. Confirm the specifications.

When selecting the product, confirm the operating conditions, such as type of gas, operating pressure (inlet and outlet), flow rate, 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.

2. Confirm allowable pressure of any pressure gauges.

When installing a pressure gauge to the product, operating pressure should not exceed the maximum allowable pressure of the pressure gauge.

Mounting

Warning

1. Confirm the mounting direction of the product.

The high pressure (inlet) port is labeled with an "HP" mark and the low pressure (outlet) port is labeled with an "LP" mark. In the case of two stage regulator, the monitor port of first stage outlet pressure is labeled with "MP" mark.

Make sure to connect the port labeled with "HP" mark, to the high pressure. If any of the ports, other than "HP", are connected to the high pressure, it may cause damage or gas leakage.

2. After installation, check internal leakage (leakage across seat) of the product.

Check internal leakage (leakage across seat) with inert gases such as nitrogen, etc., and select the most appropriate test method depending on the application. The following procedures are an example of how a test may be performed. It is intended as an overview and not as an all inclusive description.

- 1) Rotate the adjustment wheel counterclockwise (DECR) completely to relieve spring force. Then gradually open the valve at inlet side to supply gas to the regulator.
- 2) Close the valves on the inlet and outlet side and hold for at least 10 minutes. Then confirm the outlet pressure.
- 3) Rotate the adjustment wheel clockwise (INCR) until the outlet pressure reaches the outlet pressure setting. Then hold for at least 10 minutes and confirm the outlet pressure.

If outlet pressure continues increasing in steps 2) and 3) above, the regulator may have internal leakage (leakage across seat) and you should stop using the regulator immediately and contact SMC or sales representative.

3. Purge hazardous gases from system before removing regulator from system.

Before removing regulators from system, fully open regulator by turning adjustment wheel clockwise (INCR), and follow proper procedures to flush system with inert gas such as nitrogen to remove any residual hazardous gases.

Maintenance

Warning

1. If a regulator requires repair, contact SMC.

Operation

Warning

1. Do not use the regulator as shutoff valve or safety valve.

2. Do not rotate the adjustment wheel counterclockwise (DECR) under no flow conditions.

If the adjustment wheel is rotated counterclockwise (DECR) under no flow conditions but there is residual pressure remaining in outlet side, it may cause damage to the regulator. Decreasing of the setting pressure should be done under flow conditions.

3. Do not pressurize the regulator from outlet side. If high pressure, which exceeds the setting pressure, is supplied from outlet side, it may cause damage to the regulator.

4. Supply gas to the regulator.

Rotate the adjustment wheel counterclockwise (DECR) completely to relieve spring force. Then, gradually open the valve at inlet side to supply gas to the regulator. When operating the valve, do not stand in front of the regulator and pressure gauge. If the valve at inlet side is opened rapidly, high pressure gas might be supplied into outlet side of the regulator and it may cause severe damage or burst the device.

5. Adjust pressure.

When rotating the adjustment wheel clockwise (INCR), outlet pressure will increase.

In order to adjust precisely, the wheel should be adjusted at the desired flow conditions.

6. Decreasing the setting pressure under flow conditions.

When decreasing the setting pressure, make sure to open the valve at outlet side to keep flow conditions. When rotating the adjustment wheel counterclockwise (DECR) under flow conditions, setting pressure will decrease.

7. Stop using the regulator immediately if resonance occurs.

Loud audible noise as well as vibration of device or fluctuation of outlet pressure (resonance) may occur depending on operating conditions etc. If this situation occurs, stop using the regulator immediately and contact SMC or sales representative.



Process Gas Equipment/Back Pressure Regulator Specific Product Precautions

Be sure to read this before handling. Refer to the back cover for Safety Instructions and pages 166 and 167 and the Operation Manual for common precautions.
<http://www.smcworld.com>

Selection

Warning

1. Confirm the specifications.

When selecting the product, confirm the operating conditions, such as type of gas, operating pressure (inlet and outlet), flow rate, operating temperature etc., and use within the operating range specified in the catalog. Verify flow capacity of regulator and vent or return line, are large enough to vent off gas source without creating excessive back pressure. 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.

2. Confirm allowable pressure of any pressure gauges.

When installing pressure gauges to the product, operating pressure should not exceed the maximum allowable pressure of the pressure gauge.

Mounting

Warning

1. Confirm the mounting direction of the product.

The high pressure (inlet) port is labeled with an "IN" mark and the low pressure (outlet) port is labeled with an "OUT" mark. Make sure to connect the port labeled with "IN" mark, to the high pressure. If any of the ports, other than "IN", is connected to the high pressure, it may cause damage or gas leakage.

Maintenance

Warning

1. If a back pressure regulator requires repair, contact SMC.

Operation

Warning

1. Do not use the back pressure regulator as shutoff valve or safety valve.

2. Pressure control

- 1) Rotate the adjustment wheel counterclockwise completely to relieve spring force.
- 2) Partially open the valve at inlet side to supply gas to the back pressure regulator.
- 3) Increase the inlet pressure to the setting pressure by rotating the adjustment wheel clockwise.
- 4) Continue opening the valve at inlet side monitoring the inlet pressure. When the inlet pressure increases above the setting pressure, rotate the adjustment wheel counterclockwise to relieve the inlet pressure to the setting pressure.
- 5) Open the valve at inlet side completely and confirm that the inlet pressure reaches the setting pressure.

3. Decreasing the setting pressure.

When decreasing the setting pressure, make sure to gradually rotate the adjustment wheel counterclockwise until the inlet pressure reaches the setting pressure.

4. Stop using the regulator immediately if resonance occurs.

Loud audible noise as well as vibration of device or fluctuation of outlet pressure (resonance) may occur depending on operating conditions, etc. If this situation occurs, stop using the regulator immediately and contact SMC or sales representative.