Pneumatic Actuation Pressure Regulator | Low flow

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

How to Order

Port Number ① ② ③ ④

AP10 PA S 2PW FV4 FV4

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 secondary remelt	316L SS	316L SS	316L SS
SHP		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 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
4	0 to 400 psig	0 to 3 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.1058) for gauge specifications.

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)

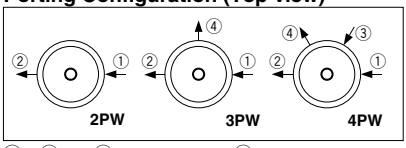
∗3) Not available with SHP, SH, H materials.
∗4) Source pressure rating is limited to 300psig (2.1MPa) or less.
∗5) PTFE seats reduce seat abrasion for flow cycle application. Gas permeation is greater with PTFE than PCTFE.

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)



①IN ②OUT ③Gauge port (Inlet) ④Gauge 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·m³/sec
	Outboard leakage	2 x 10^{-10} Pa·m³/sec ∗3)
Across the seat leak		4 x 10^{-9} Pa·m³/sec ∗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 in³ (8 cm³)

∗1) Max. 300 psig (2.1 MPa) for PTFE seat.
∗2) -10 to 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.

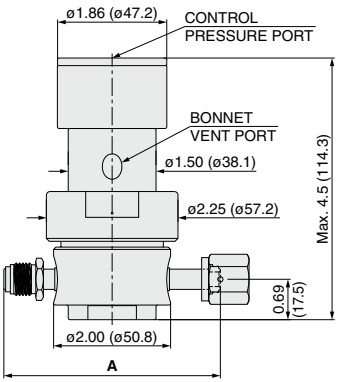
Wetted Parts Material

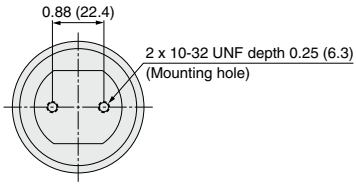
Wetted Parts	S	SHP	SH	H
Body	316L SS secondary remelt			Ni-Cr-Mo alloy
Surface finish	Electropolish + Passivation			Electropolish
Poppet	316L SS	Ni-Cr-Mo alloy		
Diaphragm	316L SS	Ni-Cr-Mo alloy		
Nozzle	316L SS		Ni-Cr-Mo alloy	
Seat	PCTFE (Option: Polyimide, PTFE)	PCTFE (Option: PTFE)		

Dimensions

inch (mm)

AP10PA

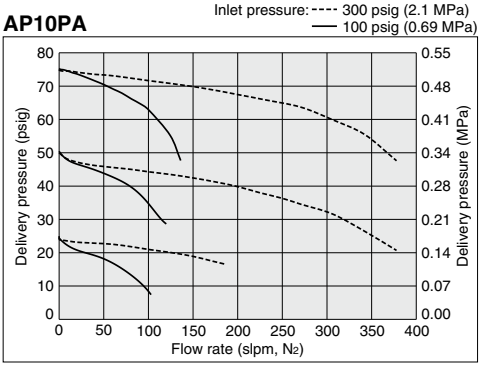




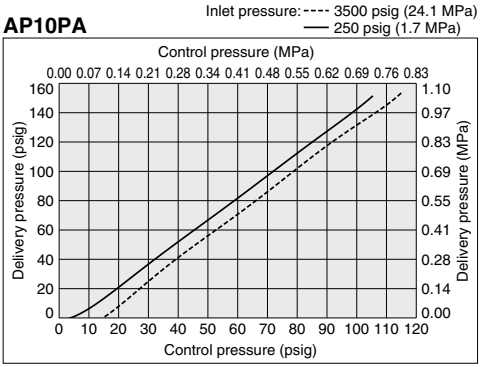
Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4		
TW4	2.96	(75.2)
FV6	4.70	(119.4)
MV6		
TW6	2.96	(75.2)

Flow Characteristics

AP10PA



AP10PA



Pneumatic Actuation Pressure Regulator

Low flow (Tied-diaphragm)

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**

How to Order

Port Number ① ② ③ ④

AP15 PA S □ 2PW FV4 FV4 □ □ □ □

Delivery pressure

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

Material

Code	Body	Poppet	Diaphragm	Nozzle
S	316L SS secondary remelt	Ni-Cr-Mo alloy	Ni-Cr-Mo alloy	316L SS
SHP				
SH				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 (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
4	0 to 400 psig	0 to 3 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.1058) for gauge specifications.

Seat material

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

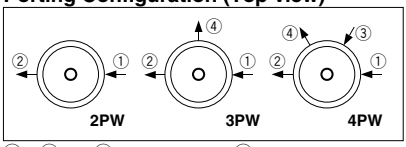
∗3) Not available with SHP, SH, H materials.

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)



①IN ②OUT ③Gauge port (Inlet) ④Gauge 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**	2×10^{-11} Pa·m³/sec
	Outboard leakage	2×10^{-10} Pa·m³/sec ∗2)
Across the seat leak		4×10^{-9} Pa·m³/sec ∗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 in³ (8.4 cm³)

∗1) -10 to 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).

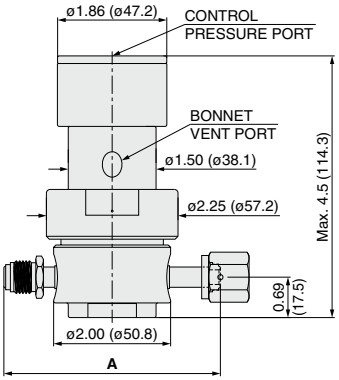
Wetted Parts Material

Wetted Parts	S	SHP	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		

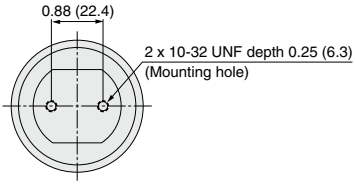
Dimensions

inch (mm)

AP15PA



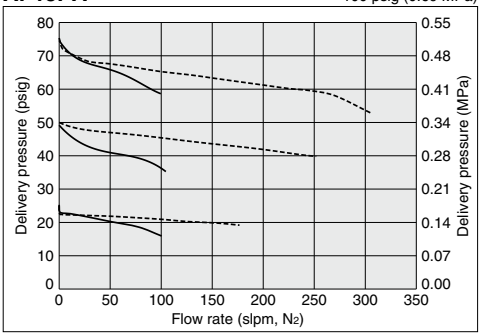
Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4		
TW4	2.96	(75.2)
FV6	4.70	(119.4)
MV6		
TW6	2.96	(75.2)



Flow Characteristics

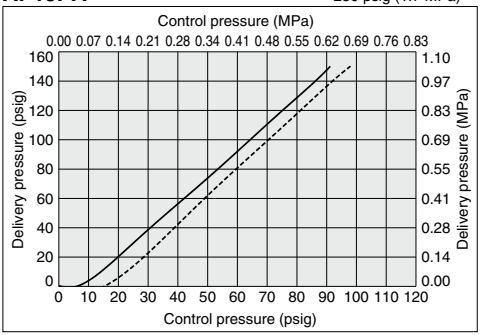
AP15PA

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



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. 2300psig(15.9 MPa)**
  HR(option): Max. 3000psig (20.7MPa)
- **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**

How to Order

Port Number ① ② ③ ④

AP14 PA T S [ ] 2PW FV4 FV4 [ ] [ ] [ ] [ ] [ ]

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 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 (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
4	0 to 400 psig	0 to 3 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.1058) for gauge specifications.

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)

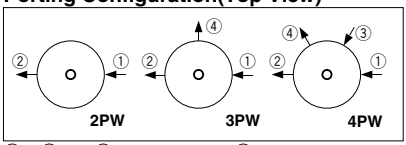
∗3) Not available with SH material.

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)



①IN ②OUT ③Gauge port (Inlet) ④Gauge 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	2×10^{-11} Pa·m³/sec
	Outboard leakage	2×10^{-10} Pa·m³/sec ∗2)
Across the seat leak		4×10^{-9} Pa·m³/sec ∗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 in³ (17.4 cm³)

∗1) -10 to 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.

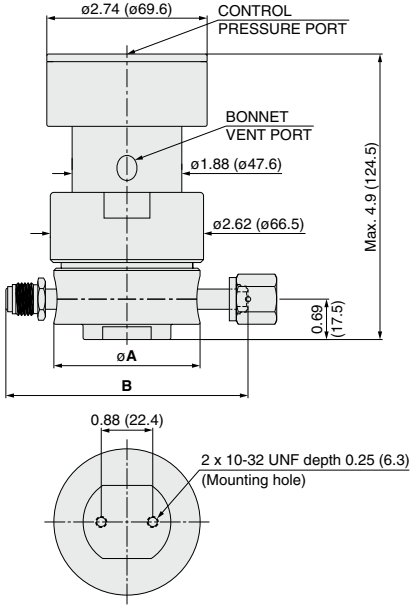
Wetted Parts Material

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)

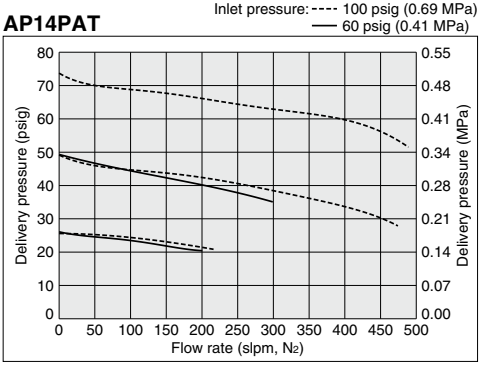
AP14PAT



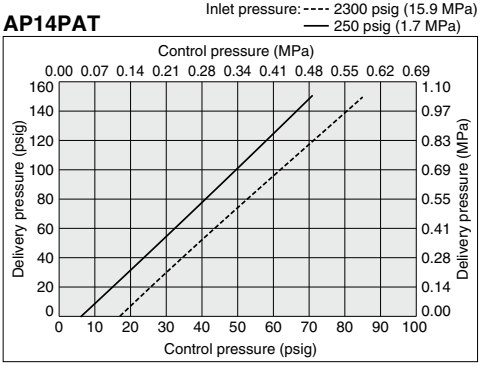
Connections	A		B	
	inch	(mm)	inch	(mm)
FV4	2.00	(50.8)	3.70	(94.0)
MV4			4.00	(101.6)
TW4			3.46	(87.9)
FV6	2.50	(63.5)	5.22	(132.6)
MV6				
TW6			4.00	(101.6)
FV8			5.22	(132.6)
MV8				
TW8			4.34	(110.2)

Flow Characteristics

AP14PAT



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. 1700psig(11.7 MPa)**
  HR(option): Max. 3000psig (20.7MPa)
- **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**

How to Order

Port Number ① ② ③ ④

AP12 PA S [ ] 2PW FV8 FV8 [ ] [ ] [ ] [ ] [ ]

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 secondary remelt	316L SS	Ni-Cr-Mo alloy	316L SS
SHP		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 (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
FV12	3/4 inch face seal (Female)
MV12	3/4 inch face seal (Male)
TW12	3/4 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
10	0 to 1000 psig	0 to 7 MPa
40	0 to 4000 psig	0 to 28 MPa

∗1) Refer to gauge guide (P.1058) for gauge specifications.

Option

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

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

∗5) 3/4 inch face seal fittings rated to 2400psig (16.5MPa) maximum.

Seat material

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

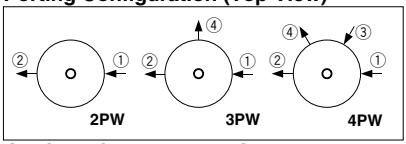
∗3) Not available with SHP and SH materials.

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)



①IN ②OUT ③Gauge port (Inlet) ④Gauge 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**	2×10^{-11} Pa·m³/sec
	Outboard leakage	2×10^{-10} Pa·m³/sec ∗2)
Across the seat leak		4×10^{-9} Pa·m³/sec ∗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 in³ (19.6 cm³)

∗1) -10 to 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) ∗1)
	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) ∗1)
	Source pressure	Vacuum to 3000 psig (20.7 MPa) ∗2)
	Proof pressure (Inlet)	4500 psig (31 MPa)
	Burst pressure	9000 psig (62 MPa)

∗1) HF and HR option will not achieve rated outlet pressure at all inlet pressures.
∗2) 3/4 inch face seal fittings rated to 2400psig (16.5MPa) maximum.

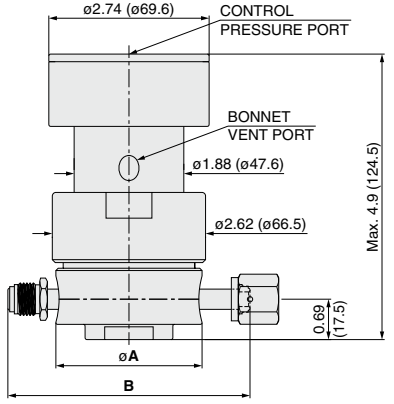
Wetted Parts Material

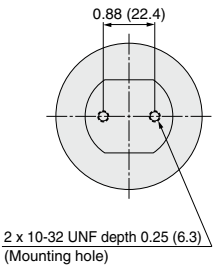
Wetted Parts	S	SHP	SH
Body	316L SS secondary remelt		
Surface finish	Electropolish + Passivation		
Poppet	316L SS	Ni-Cr-Mo alloy	
Diaphragm	Ni-Cr-Mo alloy		
Nozzle	316L SS		Ni-Cr-Mo alloy
Seat	PCTFE (Option: Polyimide)	PCTFE	

Dimensions

inch (mm)

AP12PA

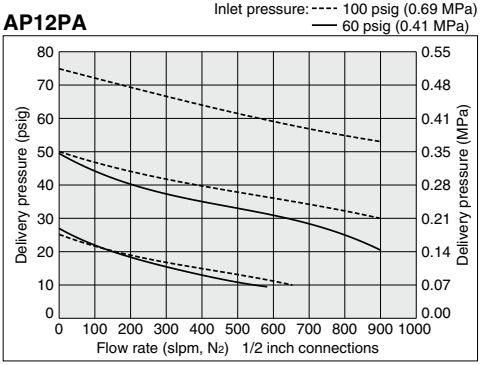




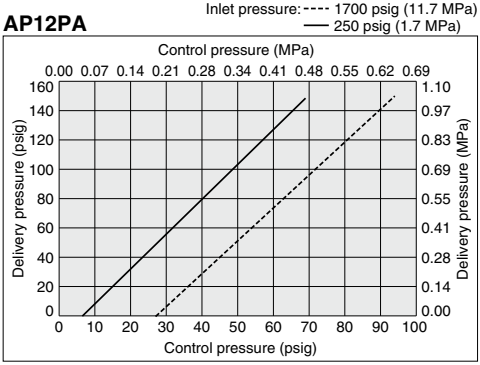
Connections	A inch	A (mm)	B inch	B (mm)
FV4	2.00	(50.8)	3.70	(94.0)
MV4			4.00	(101.6)
TW4			3.46	(87.9)
FV6	2.50	(63.5)	5.22	(132.6)
MV6				
TW6			4.00	(101.6)
FV8			5.22	(132.6)
MV8				
TW8			4.34	(110.2)
FV12			6.26	(159.0)
MV12				
TW12			5.00	(127.0)

Flow Characteristics

AP12PA



AP12PA



Pneumatic Actuation Pressure Regulator | Low flow

Series AZ10PA

- **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

Port Number ① ② ③ ④

AZ10 PA S [ ] 2PW FV4 FV4 [ ] [ ] [ ] [ ] [ ]

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 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

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.1058) for gauge specifications.

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)

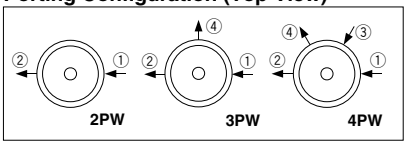
∗3) Not available with SHP material.
∗4) PTFE recommended for applications such as within a process tool.
∗5) Source pressure rating is limited to 300psig (2.1MPa) or less.

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 (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	$2x10^{-11}$ Pa·m³/sec
	Outboard leakage	$2x10^{-10}$ Pa·m³/sec ∗3)
Across the seat leak		$4x10^{-9}$ Pa·m³/sec ∗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 pisg (0.0026 MPa) rise in delivery pressure per 100 psig (0.7 MPa) source pressure drop
Installation		Bottom mount
Internal volume		0.49 in³ (8 cm³)

∗1) Max. 300 psig (2.1 MPa) for PTFE seat.
∗2) -10 to 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.

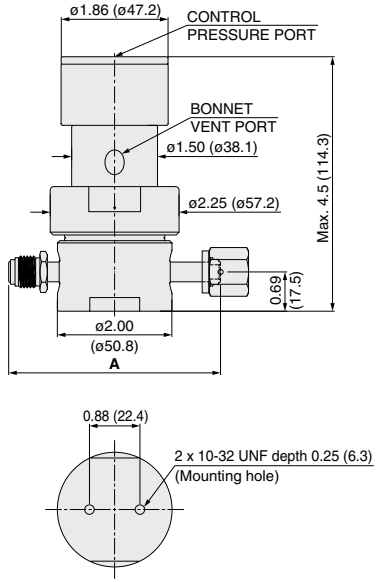
Wetted Parts Material

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)

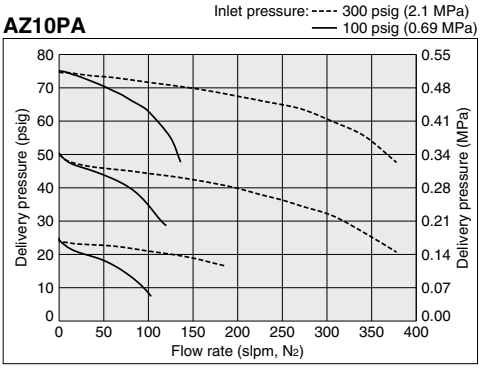
AZ10PA



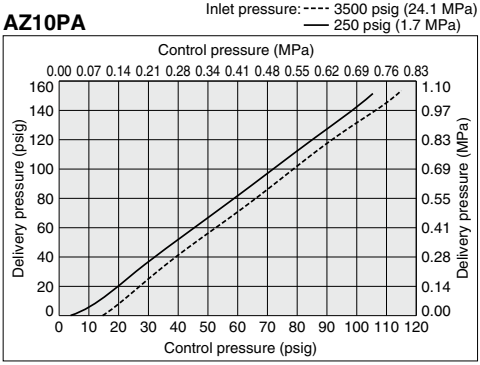
Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4		
FV6	4.70	(119.4)
MV6		
TW6	2.96	(75.2)

Flow Characteristics

AZ10PA



AZ10PA



Pneumatic Actuation Pressure Regulator

Low flow (Tied-diaphragm)

Series AZ15PA

- **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

Port Number ① ② ③ ④

AZ15 PA S □ 2PW FV4 FV4 □ □ □ □

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 µin. (0.25 µm) Standard
Q	25 µin. (0.62 µm)

Seat material

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

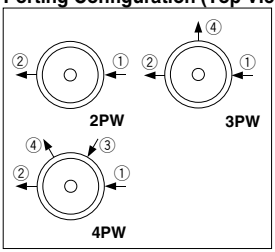
*3) Not available with SHP material.

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)



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

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

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) Other range available. Refer to gauge guide (P.1058).

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**	$2x10^{-11}$ Pa·m³/sec
	Outboard leakage	$2x10^{-10}$ Pa·m³/sec *2)
Across the seat leak		$4x10^{-9}$ Pa·m³/sec *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		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 in³ (8.4 cm³)

*1) -10 to 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).

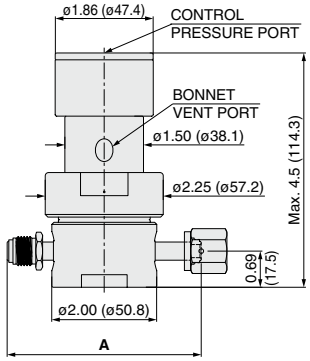
Wetted Parts Material

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

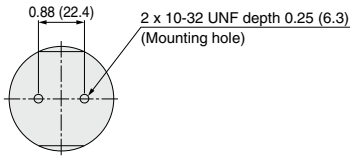
Dimensions

inch (mm)

AZ15PA

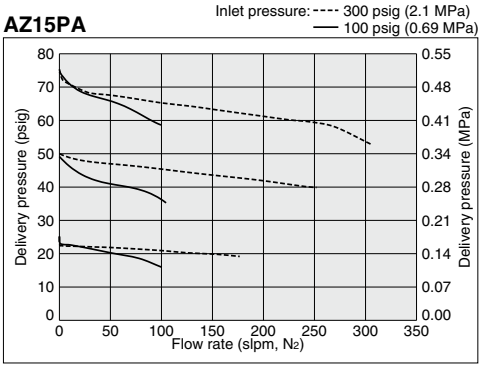


Connections	A	
	inch	(mm)
FV4	3.70	(94.0)
MV4		
FV6	4.70	(119.4)
MV6		
TW6	2.96	(75.2)

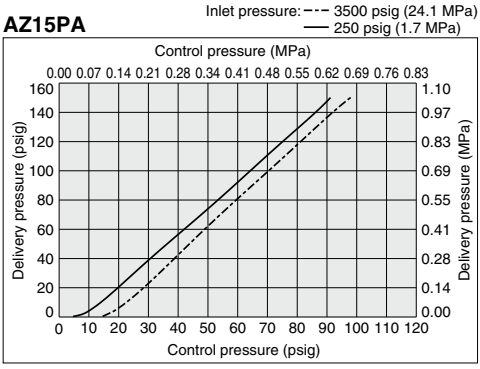


Flow Characteristics

AZ15PA



AZ15PA



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. 2300psig(15.9 MPa)**
  HR(option): Max. 3000psig (20.7MPa)
- **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**

How to Order

Port Number ① ② ③ ④

AZ14 PA T S □ 2PW FV4 FV4 □ □ □ □ □

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

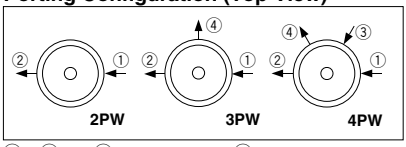
Surface finish

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

Ports

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

Porting Configuration (Top View)



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

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
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
4	0 to 400 psig	0 to 3 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.1058) for gauge specifications.

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

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

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**	$2x10^{-11}$ Pa·m³/sec
	Outboard leakage	$2x10^{-10}$ Pa·m³/sec *2)
Across the seat leak		$4x10^{-9}$ Pa·m³/sec *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 in³ (17.4 cm³)

*1) -10 to 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.

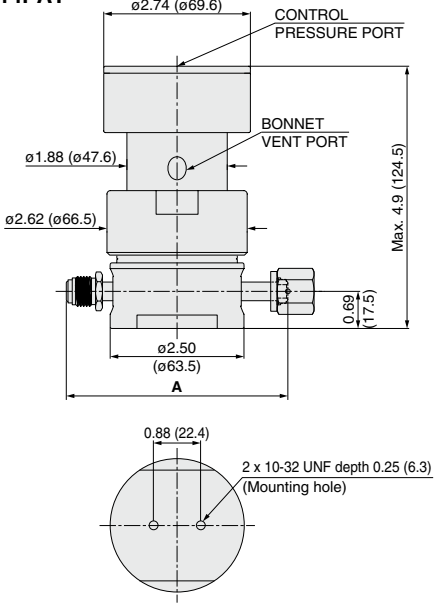
Wetted Parts Material

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)

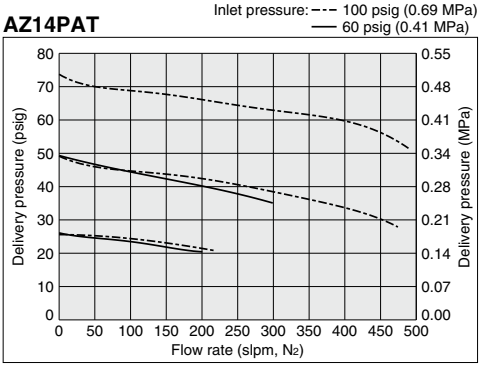
AZ14PAT



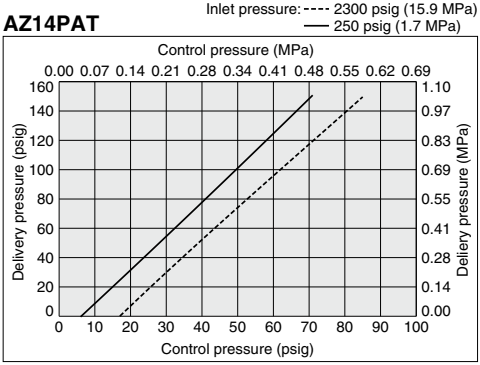
Connections	A	
	inch	(mm)
FV4	4.30	(109.2)
MV4		
FV6	5.22	(132.6)
MV6		
TW6	4.00	(101.6)
FV8	5.22	(132.6)
MV8		
TW8	4.34	(110.2)

Flow Characteristics

AZ14PAT



AZ14PAT



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**

How to Order

Port Number ① ② ③ ④

AZ12 PA S [ ] 2PW FV8 FV8 [ ] [ ] [ ] [ ] [ ]

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	

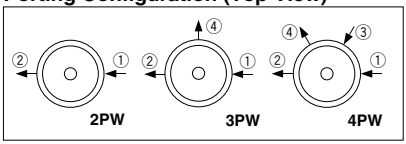
Surface finish

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

Porting Configuration (Top View)



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

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
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

∗1) Refer to gauge guide (P.1058) for gauge specifications.

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.

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		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**	$2x10^{-11}$ Pa·m³/sec
	Outboard leakage	$2x10^{-10}$ Pa·m³/sec ∗2)
Across the seat leak		$4x10^{-9}$ Pa·m³/sec ∗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 in³ (19.6 cm³)

∗1) -10 to 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.

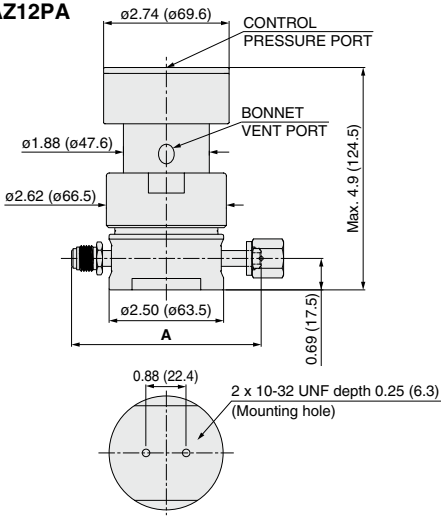
Wetted Parts Material

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

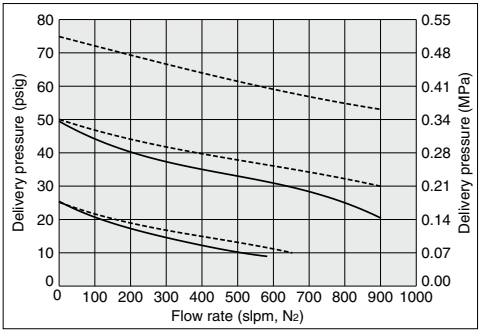


Connections	A	
	inch	(mm)
FV4	4.30	(109.2)
MV4		
FV6	5.22	(132.6)
MV6		
TW6	4.00	(101.6)
FV8	5.22	(132.6)
MV8		
TW8	4.34	(110.2)

Flow Characteristics

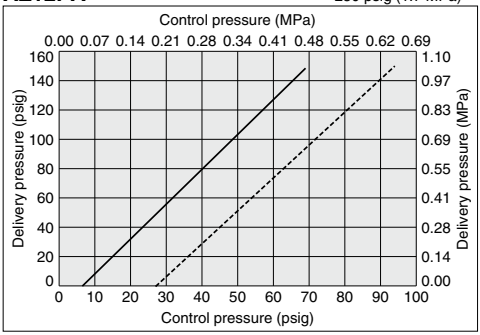
AZ12PA

Inlet pressure: ---- 100 psig (0.69 MPa) —— 60 psig (0.41 MPa)
1/2 inch connections



AZ12PA

Inlet pressure: ---- 1700 psig (11.7 MPa)
—— 250 psig (1.7 MPa)



Pneumatic Actuation Pressure Regulator | Low flow

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**

How to Order

Port Number ① ② ③ ④ ⑤

AK10 PA S 4PL 4 4 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		
SH		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

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 (Extra bottom outlet③, Inlet④, Outlet⑤)

Code	Pressure gauge ∗1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch NPT)	
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
2	0 to 200 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) Other range available. Refer to gauge guide (P.1058).

Option

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

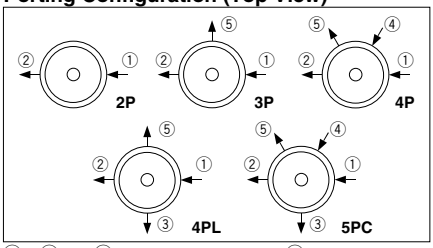
∗6) Full outlet pressure rating may not be achieved at all inlet pressure.

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 300psig (2.1MPa) or less.
∗5) PTFE seats reduce seat abrasion for flow cycle application. Gas permeation is greater with PTFE than PCTFE.

Porting Configuration (Top View)



①IN ②OUT ③Extra bottom port (Outlet) ④Gauge port (Inlet) ⑤Gauge 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·m³/sec
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 in³ (8 cm³)

∗1) Max. 300 psig (2.1 MPa) for PTFE seat.
∗2) -10 to 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.

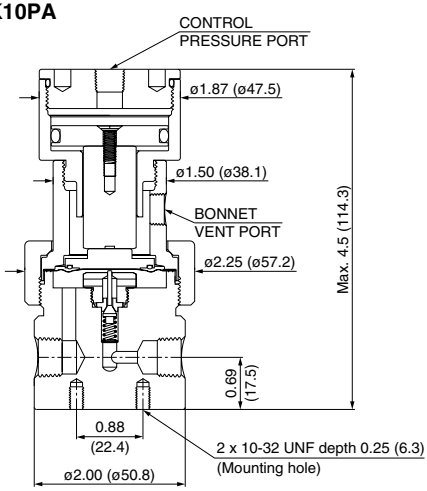
Wetted Parts Material

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

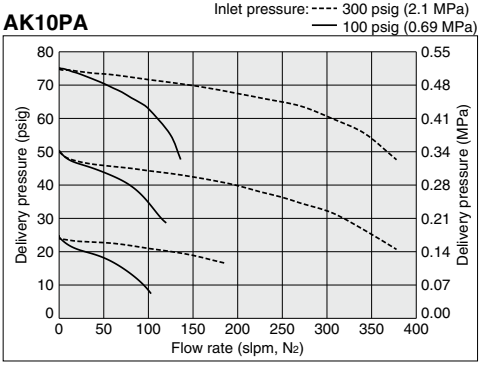
inch (mm)

AK10PA

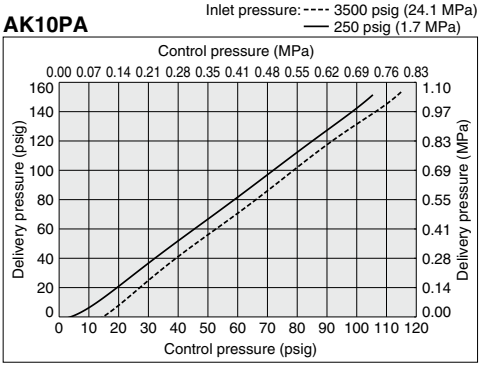


Flow Characteristics

AK10PA



AK10PA



Pneumatic Actuation Pressure Regulator

Low flow (Tied-diaphragm)

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**

How to Order

Port Number ① ② ③ ④ ⑤

AK15 PA S 4PL 4 4 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		
SH		Ni-Cr-Mo alloy	Ni-Cr-Mo alloy

Ports

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

Seat material

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

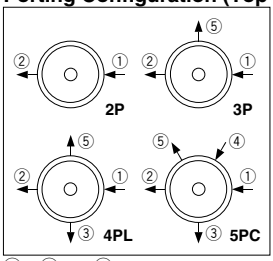
∗3) Not available with SH material.

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.

Porting Configuration (Top View)



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

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	Pressure gauge ∗1) MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch NPT)	
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
2	0 to 200 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) Other range available. Refer to gauge guide (P.1058).

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·m³/sec
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 in³ (8.7 cm³)

∗) -10 to 90 °C for Polyimide and PEEK seat. Optional ambient and operating temperature range available. Please contact SMC.

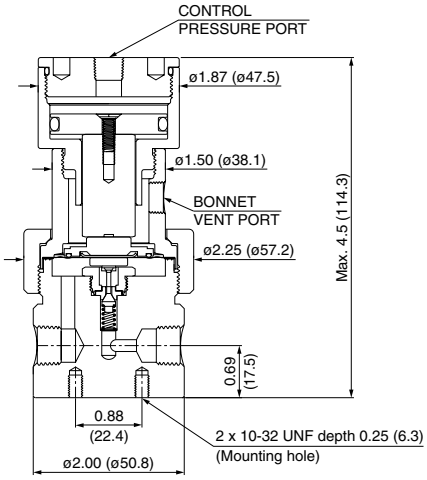
Wetted Parts Material

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

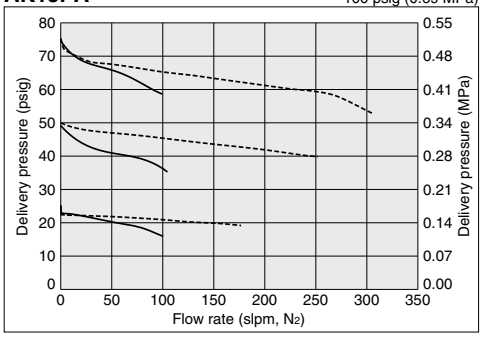
inch (mm)

AK15PA

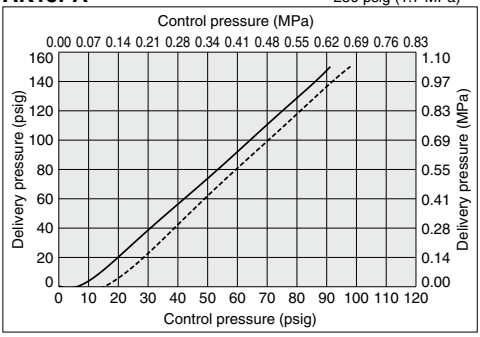


Flow Characteristics

AK15PA



AK15PA



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)**

How to Order

AK14 PA T S 4PL 6 6 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)

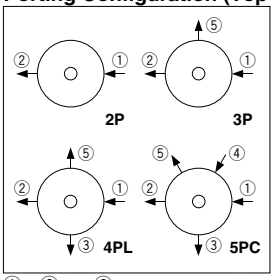
Material

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

Ports

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

Porting Configuration (Top View)



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

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.

Gauge port (Extra bottom outlet③, Inlet④, Outlet⑤)

Code	Pressure gauge *1) psig/bar unit	Pressure gauge *1) MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch NPT)	
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
2	0 to 200 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) Other range available. Refer to gauge guide (P.1058).

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.

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·m³/sec
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 in³ (18.7 cm³)

*) -10 to 90 °C for Polyimide seat.

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.

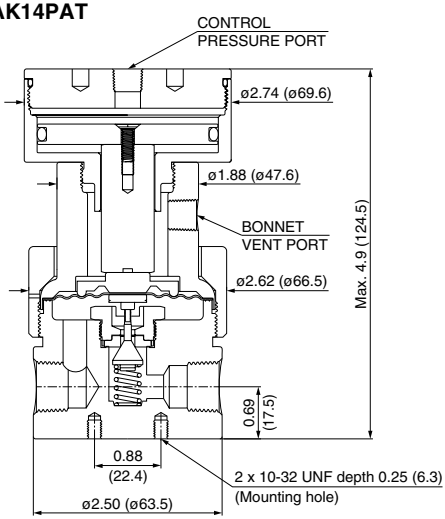
Wetted Parts Material

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

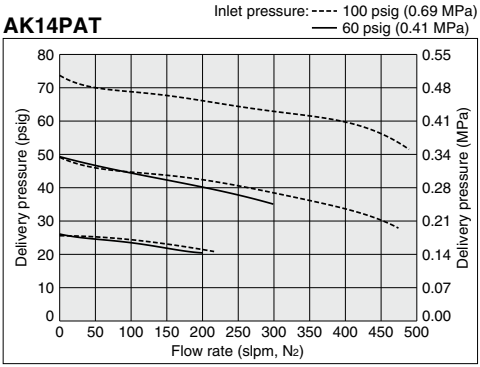
inch (mm)

AK14PAT

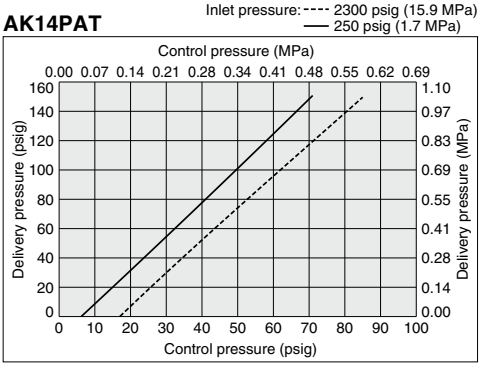


Flow Characteristics

AK14PAT



AK14PAT



Pneumatic Actuation Pressure Regulator

High flow (Tied-diaphragm)

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**

How to Order

AK12 PA S 4PL 8 8 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)

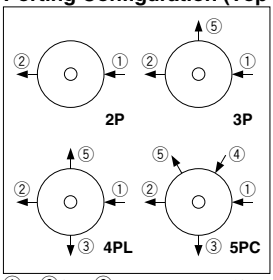
Material

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

Ports

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

Porting Configuration (Top View)



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

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 (Extra bottom outlet③, Inlet④, Outlet⑤)

Code	Pressure gauge ∗1)	
	psig/bar unit	MPa unit
No code	No gauge port	
0	No pressure gauge (Connections: 1/4 inch NPT)	
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
2	0 to 200 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) Other range available. Refer to gauge guide (P.1058).

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.

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·m³/sec
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
Internal volume	1.32 in³ (21.6 cm³)

∗) -10 to 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.

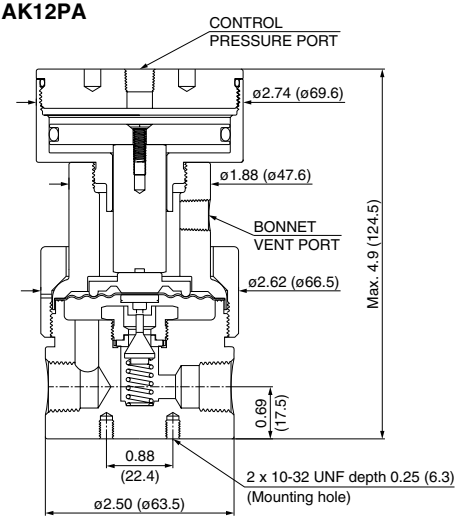
Wetted Parts Material

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

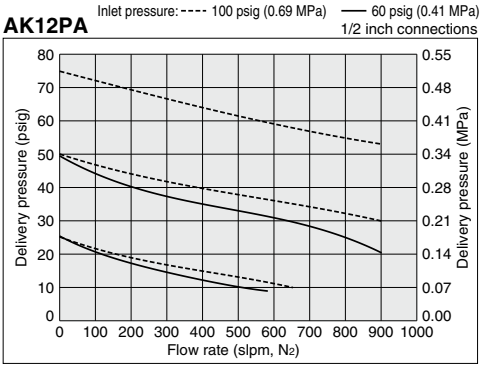
inch (mm)

AK12PA

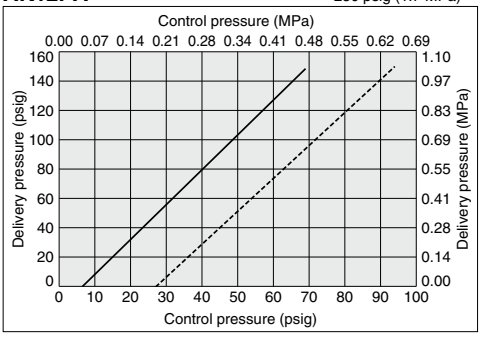


Flow Characteristics

AK12PA



AK12PA

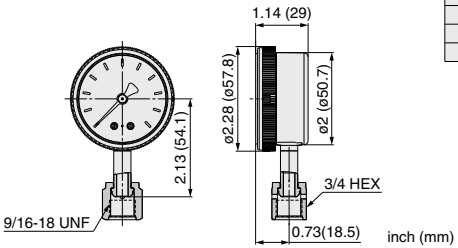


Regulator
Pressure Gauges Guide

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



inch (mm)

Model

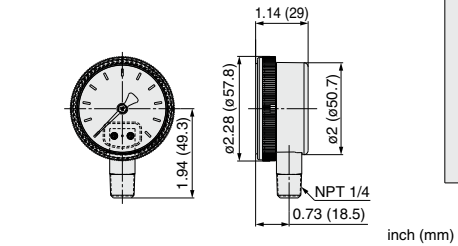
Regulator Code *2) gauge port	unit	Pressurerange	Unit	Part number *3)
V3	**(No code)**	-30 in.Hg to 30 psig	psig/bar *4)	**00-83000023**
L		-30 in.Hg to 60 psig		**00-83000026**
1		-30 in.Hg to 100 psig		**00-83000021**
H		-30 in.Hg to 160 psig		**00-83000116**
2		0 to 200 psig		**00-83000020**
4		0 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



inch (mm)

Model

Regulator Code *2) material	gauge port	unit	Pressure range	Unit	Part number *3)
S SH	**V15**	**(No code)**	-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		**00-83000187**
	30		0 to 3000 psig		**00-83000234**
	40		0 to 4000 psig		**00-83000183**
	V15	**MPA**	-0.1 to 0.1 MPa	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		**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.

For AK/BP series (Installed before shipment / Order separately)

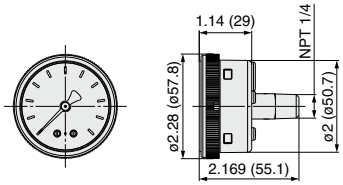
Stainless steel / Center back mount

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)

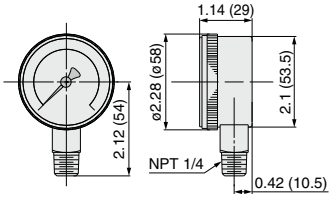
Brass / Lower mount

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
	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		0 to 1000 psig		**00-83000186**
	40		0 to 4000 psig		**00-83000179**
	V3	**MPA**	-0.1 to 0.2 MPa	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 before handling. Refer to front matter 41 for Safety Instructions and pages 941 and 942 and the "Operation Manual" for common precautions.
Operation manual is available from the SMC website. 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.