

Regulators

Series

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● For ultra high purity (UHP)

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● For general applications

| | | |
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● For ultra high purity (UHP)

| | | |
|-------------------------|---------------|-------|
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|-------------------------|---------------|-------|

● For air operated applications

| | | |
|--|----------------|-------|
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| | |
|---|-------|
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AP

SL

AZ

AK

BP

Single Stage Compact Regulator for Ultra High Purity

AP500 Series

- 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) |

Material

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

Surface finish

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

Ports

| Code | Ports |
|------|---------|
| 2PW | 2 ports |
| 3PWG | 3 ports |

Range options

| Code | Specification |
|---------|-----------------|
| No code | Standard |
| A | Sub-atmospheric |

*1) Only available with AP501.

Pressure gauge unit

| 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.

Option

| Code | Specification | Cv |
|---------|-----------------------|------|
| No code | Standard | |
| FI | Friction dampener *6) | 0.06 |
| 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.

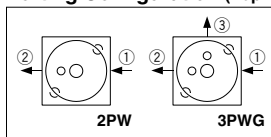
Seat material

| 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) | |
|---------|-----------------------------------|---------------------------------------|
| | psig/bar unit | MPa unit |
| 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 | pressure gauge | 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.752) 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 | 1.5 times the maximum source pressure | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | |
| | Outlet | 3 times the maximum delivery pressure | | | |
| 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 μm. (0.4 μm) Option: 10 μm. (0.25 μm), 7 μm. (0.18 μm), 5 μm. (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 **AP500 Series**

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 | | | | |

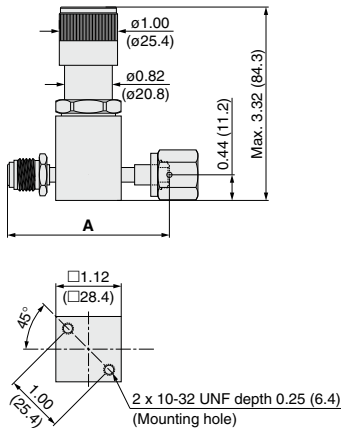
Wetted Parts Material

| 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)

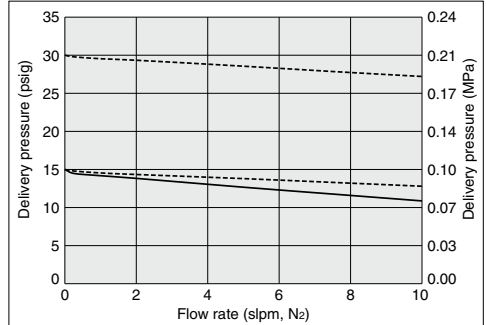
AP500



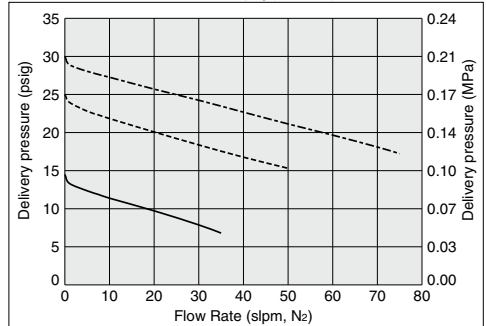
| Connections | A | |
|-------------|------|--------|
| | inch | (mm) |
| FV4 | 2.78 | (70.6) |
| MV4 | 2.12 | (53.8) |

Flow Rate Characteristics

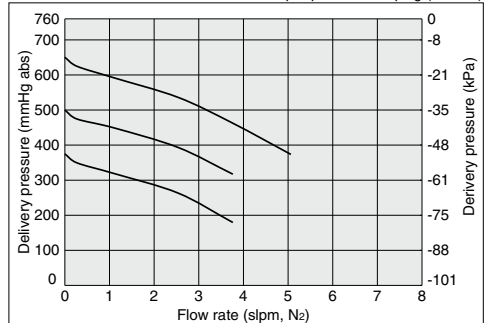
AP500 Inlet pressure: - - - - 100 psig (0.69 MPa) — 30 psig (0.21 MPa)



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.

AP

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BP

Single Stage Regulator for Ultra High Purity

Low to intermediate flow

AP1000 Series

- 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 | | | |
| SH | remelt | 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) | |
|---------|---|-----------------|
| | 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.752) for gauge specifications.
Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Sample Order Number

| AP1001S | Port | | | |
|---------|------|-----|----|-----|
| | ① | ② | ③ | ④ |
| 2PW | FV4 | FV4 | | |
| 3PW | FV4 | FV4 | 0 | |
| 3PW | FV4 | FV4 | V3 | MPA |
| 4PW | FV4 | FV4 | V3 | 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) |

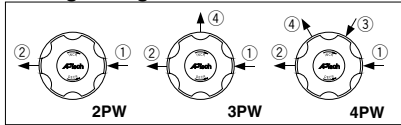
- *3) Not available with SHP, SH, H materials.
- *4) PTFE recommended for applications such as within a process tool.
- *5) Source pressure rating is limited to 300 psig (2.1 MPa) or less.

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)

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 (2.1MPa) | | Vacuum to 3500 psig (24.1 MPa) *1) | | |
| Proof pressure | 1.5 times the maximum source pressure | | | | |
| Burst pressure | 3 times the maximum source pressure | | | | |
| Ambient and operating temperature | -40 to 71°C (No freezing) *2) | | | | |
| Cv | 0.09 | | | | |
| Leak rate | 2 x 10 ⁻¹¹ Pa·m ³ /s | | | | |
| 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 **AP1000 Series**

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 | | | | |

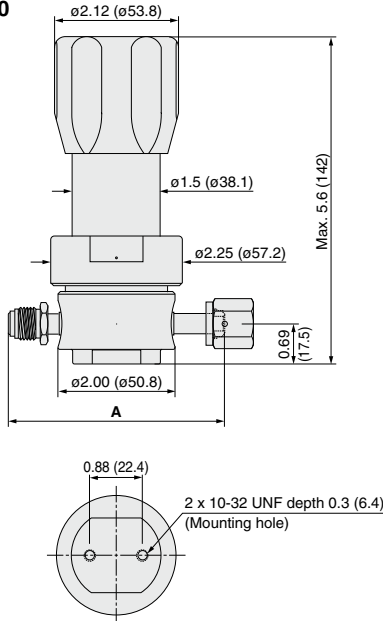
Wetted Parts Material

| 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)

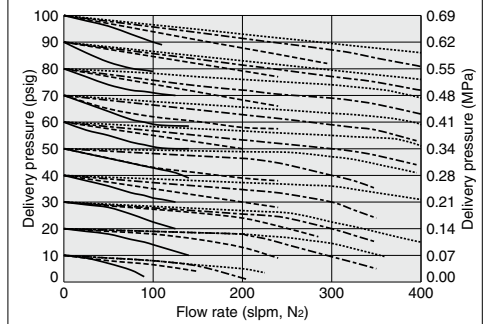
AP1000



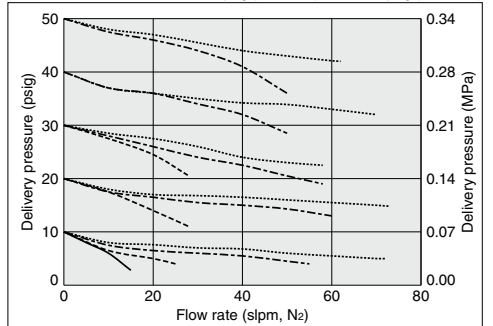
| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 3.70 | (94.0) |
| MV4 | 2.96 | (75.2) |
| TW4 | 2.96 | (75.2) |
| FV6 | 4.70 | (119.4) |
| MV6 | 4.70 | (119.4) |
| TW6 | 2.96 | (75.2) |

Flow Rate Characteristics

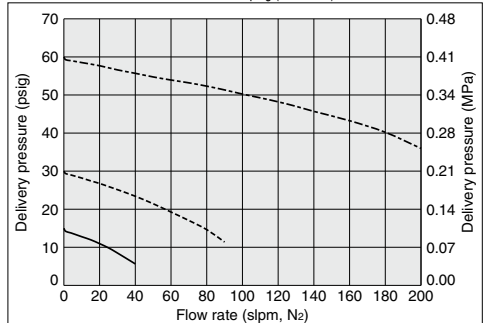
Inlet pressure: 2000-3000 psig (13.8-20.7 MPa) --- 1000 psig (6.9 MPa)
 ----- 500 psig (3.4 MPa) ——— 200 psig (1.4 MPa)



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



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.

AP

SL

AZ

AK

BP

Single Stage Regulator for Ultra High Purity

Low flow
(Tied-diaphragm)

AP1500 Series

- 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

Port Number

① ② ③ ④

AP15 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) |
| 15 | 5 to 150 psig (0.034 to 1.0 MPa) |

Material

| Code | Body | Poppet | Diaphragm | Nozzle |
|------|-------------------|----------------|----------------|----------------|
| S | 316L SS secondary | 316L SS | 316L SS | 316L SS |
| SH | remelt | 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 port |
| 3PW | 3 port |
| 4PW | 4 port |

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 | psig/bar unit | MPa unit |
| 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. 1.56 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)

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 |

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 | 1.5 times the maximum source pressure | | |
| | Outlet | 1.5 times the maximum delivery pressure | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | |
| | Outlet | 3 times the maximum delivery pressure | | |
| 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 (0.028 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 **AP1500 Series**

Low flow (Tied-diaphragm)

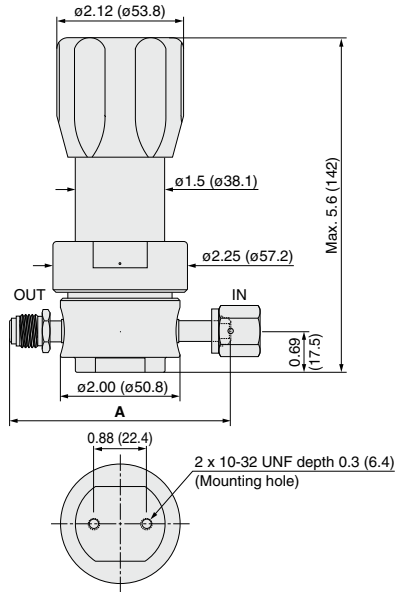
Wetted Parts Material

| 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 | PTFE (Option: Polyimide) | | PTFE | |

Dimensions

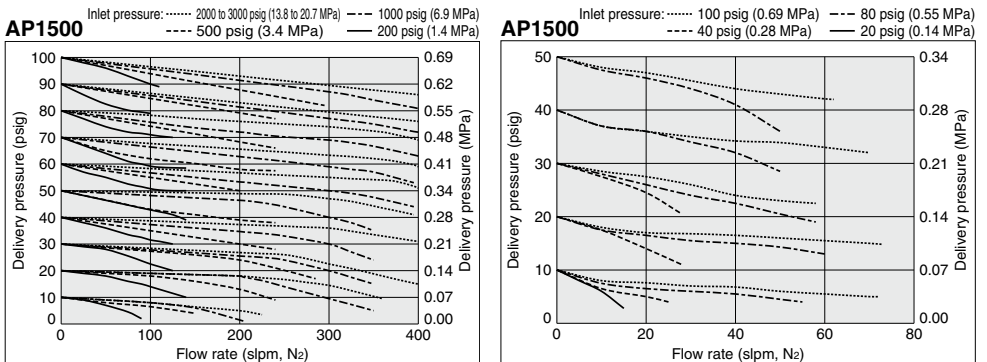
inch (mm)

AP1500



| 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 Rate Characteristics



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

AP
SL
AZ
AK
BP

Single Stage Regulator for Ultra High Purity

Low to intermediate flow

AP1600 Series



RoHS

- 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

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 (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 *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.

Gauge port (Inlet ③, Outlet ④)

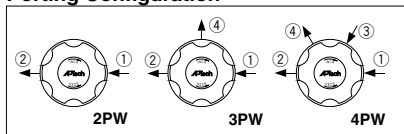
| Code | Pressure gauge *1) | |
|---------|--|-----------------|
| | psig/bar unit | MPa unit |
| No code | No gauge port | |
| 0 | No pressure gauge (Connections: 1/4 inch face seal male) | |
| V3 | -30 in.Hg to 30 psig | -0.1 to 0.2 MPa |
| L | -30 in.Hg to 60 psig | -0.1 to 0.4 MPa |
| 1 | -30 in.Hg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

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)

*1) Refer to gauge guide (P.752) 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 |
|---------|-----|-----|-----|----------|
| AP1601S | 2PW | FV4 | FV4 | |
| | 3PW | FV4 | FV4 | 0 |
| | 3PW | FV4 | FV4 | V3 MPA |
| | 4PW | FV4 | FV4 | 1 V3 MPA |
| | 4PW | FV4 | FV4 | 0 0 |

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 | 1.5 times the maximum source pressure | | |
| | Outlet | 1.5 times the maximum delivery pressure | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | |
| | Outlet | 3 times the maximum delivery pressure | | |
| 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 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.

Single Stage Regulator for Ultra High Purity **AP1600 Series**

Low to intermediate flow

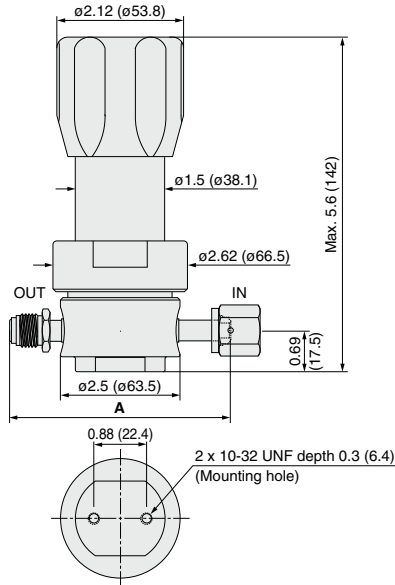
Wetted Parts Material

| 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)

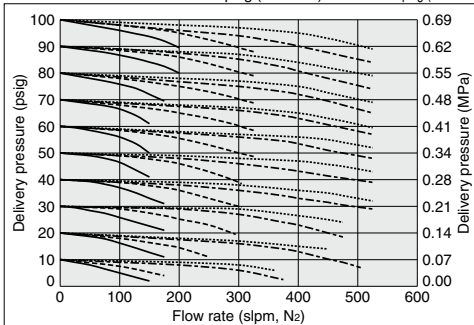
AP1600



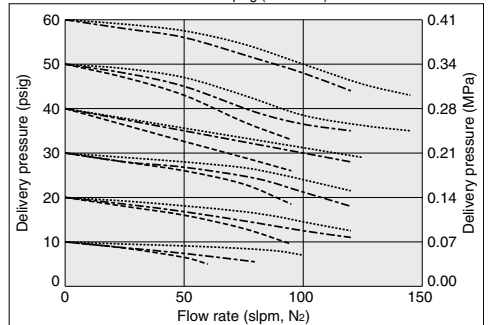
| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 4.30 | (109.2) |
| MV4 | 3.46 | (87.9) |
| FV6 | 5.22 | (132.6) |
| MV6 | 4.00 | (101.6) |

Flow Rate 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)

AP1900 Series

- 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 |

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) |

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 |

*1) Refer to gauge guide (P.732) 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 *3) |

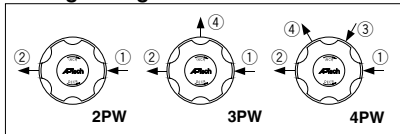
*3) Not available with SH material.

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 |
|------|---------|-----|-----|-----|
| | AP1901S | 2PW | FV4 | FV4 |
| | 3PW | FV4 | FV4 | 0 |
| | 3PW | FV4 | FV4 | V3 |
| | 4PW | FV4 | FV4 | 40 |
| | 4PW | FV4 | FV4 | 0 |

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 | 1.5 times the maximum source pressure | | | | |
| Burst pressure | 3 times the maximum source pressure | | | | |
| Ambient and operating temperature | -40 to 71°C (No freezing) *1) | | | | |
| Cv | 0.13 | | | | |
| Leak rate | 2 x 10 ⁻¹¹ Pa·m ³ /s | | | | |
| Across the seat leak | 2 x 10 ⁻¹⁰ 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 | | | | |
| 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 **AP1900 Series**

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 | | | | |

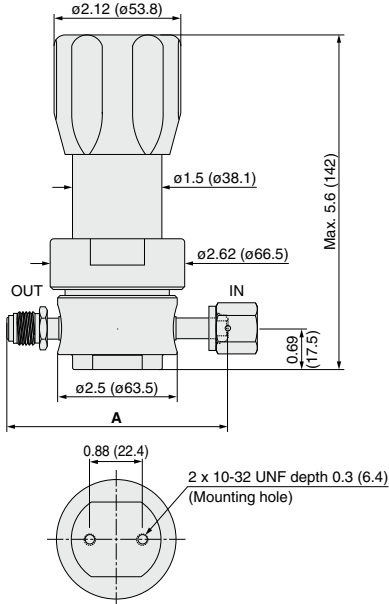
Wetted Parts Material

| 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)

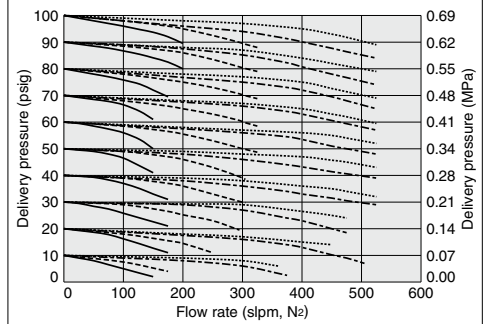
AP1900



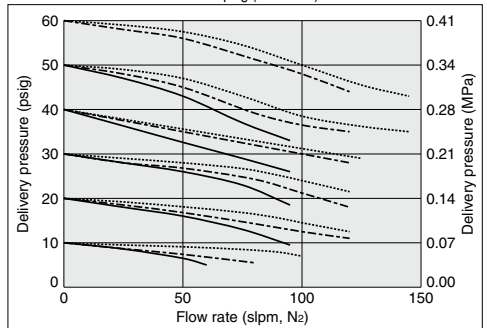
| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 4.30 | (109.2) |
| MV4 | 4.30 | (109.2) |
| TW4 | 3.46 | (87.9) |
| FV6 | 5.22 | (132.6) |
| MV6 | 5.22 | (132.6) |
| TW6 | 4.00 | (101.6) |
| FV8 | 5.22 | (132.6) |
| MV8 | 5.22 | (132.6) |
| TW8 | 4.34 | (110.2) |

Flow Rate Characteristics

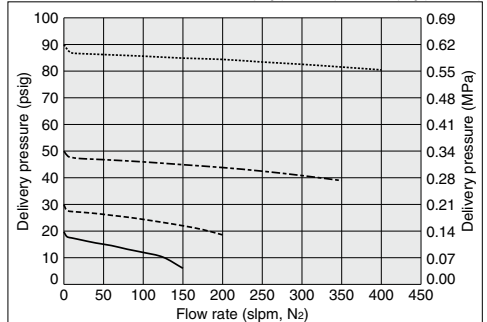
AP1900 Inlet pressure: 2000 to 3000 psig (13.8 to 20.7 MPa) --- 1000 psig (6.9 MPa)
 ----- 500 psig (3.4 MPa) ——— 200 psig (1.4 MPa)



AP1900 Inlet pressure: 100 psig (0.69 MPa) --- 80 psig (0.55 MPa)
 ——— 60 psig (0.41 MPa)



AP1900HF Inlet pressure: 600 psig (4.1 MPa) --- 300 psig (2.1 MPa)
 ----- 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.

Single Stage Regulator for Ultra High Purity

Intermediate flow
(Tied-diaphragm)

AP1400T Series

- 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



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 | Ni-Cr-Mo alloy | Ni-Cr-Mo alloy | 316L SS |
| SH | secondary remelt | | | Ni-Cr-Mo alloy |

Surface finish

| Code | Surface finish Ra max |
|---------|------------------------------------|
| No code | 15 μ m. (0.4 μ m) Standard |
| M | 10 μ m. (0.25 μ m) |
| V | 7 μ m. (0.18 μ m) |
| X | 5 μ m. (0.13 μ m) |

Range options

| Code | Range |
|---------|-----------------|
| No code | Standard |
| A | Sub-atmospheric |

*1 Only available with AP1402T.

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 *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 |
| 4 | 0 to 400 psig 0 to 3 MPa |
| 40 | 0 to 4000 psig 0 to 28 MPa |

*2 Refer to gauge guide (P.752) 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 |
|---------|-----|-----|-----|----------|
| AP1410T | 2PW | FV4 | FV4 | |
| | 3PW | FV4 | FV4 | 0 |
| | 3PW | FV4 | FV4 | 1 MPa |
| | 4PW | FV4 | FV4 | 40 1 MPa |
| | 4PW | FV4 | FV4 | 0 0 |

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 |

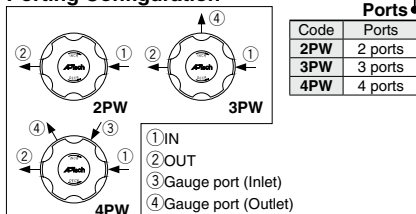
*4) Not available with SH material.

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



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 300 psig (2.1 MPa) | Vacuum to 2300 psig (15.9 MPa) | | | |
| Proof pressure | Inlet | 1.5 times the maximum source pressure | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | |
| | Outlet | 3 times the maximum delivery pressure | | | |
| Ambient and operating temperature | -40 to 71°C (No freezing) *2 | | | | |
| 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 *3 | | | |
| Across the seat leak | 4 x 10 ⁻⁹ Pa·m ³ /s *4 | | | | |
| Surface finish | Ra max 15 μ m. (0.4 μ m) Option: 10 μ m. (0.25 μ m), 7 μ m. (0.18 μ m), 5 μ m. (0.13 μ m) | | | | |
| Connections | Face seal, Tube weld NPT 1/8 inch *5 | | | | |
| Bonnet port | | | | | |
| 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 in ³ (17.4 cm ³) | | | | |
| Weight | 2.04 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 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.

Single Stage Regulator for Ultra High Purity **AP1400T Series**

Intermediate flow (Tied-diaphragm)

Option

High inlet pressure

Changes from the standard type are:

| Option | Other Parameters | AP1410T | AP1415T |
|--------|------------------|--------------------------------|---------|
| HR | Source pressure | Vacuum to 3000 psig (20.7 MPa) | |

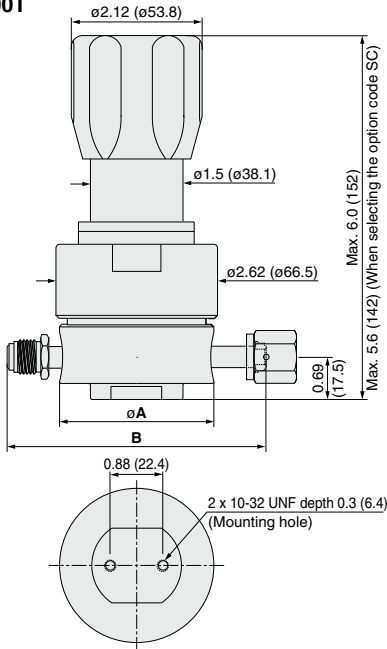
Wetted Parts Material

| 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)

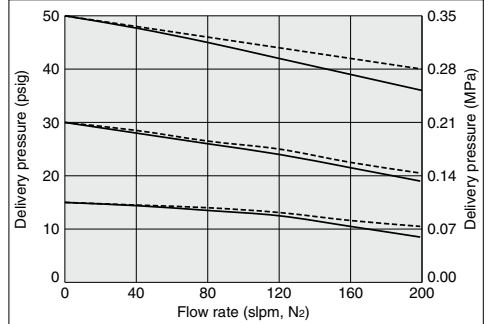
AP1400T



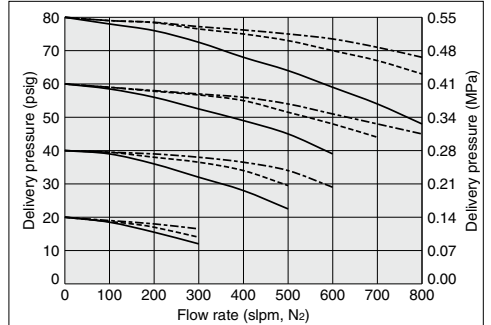
| Connections | A | | B | |
|-------------|------|--------|------|---------|
| | inch | (mm) | inch | (mm) |
| FV4 | 2.00 | (50.8) | 3.70 | (94.0) |
| MV4 | | | 4.00 | (101.6) |
| TW4 | | | 3.46 | (87.9) |
| FV6 | 2.50 | (63.5) | 5.22 | (132.6) |
| MV6 | | | 4.00 | (101.6) |
| TW6 | | | 4.00 | (101.6)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

Flow Rate Characteristics

AP1400T Inlet pressure: - - - 80 psig (0.55 MPa) — 60 psig (0.41 MPa)

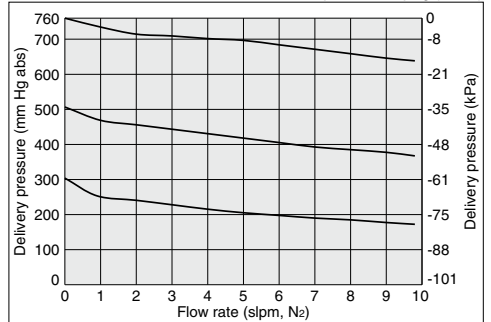


AP1400T Inlet pressure: - - - 2000 psig (13.8 MPa) - - - 600 psig (4.1 MPa) — 200 psig (1.4 MPa)



AP1402TA

Inlet pressure: 0 psig (0 kPa)



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

AP

SL

AZ

AK

BP

Single Stage Regulator for Ultra High Purity

High flow (Tied-diaphragm)

AP1200 Series

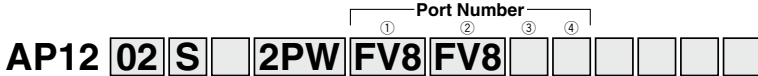
- For UHP gas delivery
- High inlet pressure type Standard: Max. 1700 psig (11.7 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity Standard: to 800 slpm
HF (option): to 1000 slpm
FC (option): to 1500 slpm

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



ROHS

How to Order



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 | Ni-Cr-Mo alloy | 316L SS |
| SHP | 316L SS 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.

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.

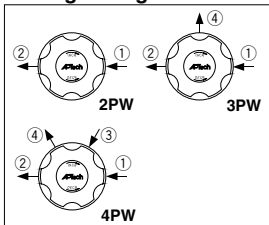
Option

| 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.

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.752) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

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.

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 | 1.5 times the maximum source pressure | | | | |
| Inlet | 1.5 times the maximum delivery pressure | | | | |
| Outlet | 3 times the maximum source pressure | | | | |
| Burst pressure | 3 times the maximum delivery pressure | | | | |
| Inlet | 4 x 10 ⁻⁹ Pa·m ³ /s *5) | | | | |
| Outlet | 3 times the maximum delivery pressure | | | | |
| Ambient and operating temperature | -40 to 71°C (No freezing) *3) | | | | |
| Cv | 0.65 | | | | |
| Leak rate | 2 x 10 ⁻¹¹ Pa·m ³ /s | | | | |
| Inboard leakage | 2 x 10 ⁻¹⁰ Pa·m ³ /s *4) | | | | |
| Outboard leakage | 4 x 10 ⁻⁹ Pa·m ³ /s *5) | | | | |
| 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 NPT 1/8 inch *6) | | | | |
| Connections | NPT 1/8 inch *6) | | | | |
| 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 in ³ (17.6 cm ³) | | | | |
| 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 (5.5MPa) 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 **AP1200 Series**

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 |
| | 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 | AP1210 | AP1215 |
| | 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, 3/4 inch face seal, 1/2, 3/4 inch tube weld | |

3. High inlet pressure

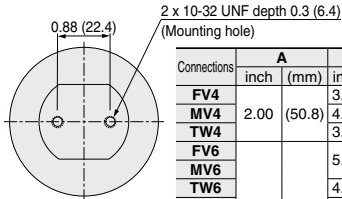
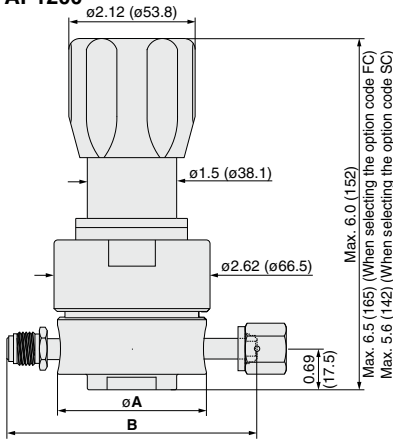
Changes from the standard type are:

| | | | |
|-----------|------------------------|--------------------------------|---------------|
| Option | Other Parameters | AP1210 | AP1215 |
| HR | Source pressure | Vacuum to 3000 psig (20.7 MPa) | |

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 | 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) |
| TW8 | | | 6.26 | (159.0) |
| FV12 | 5.00 | (127.0) | 6.26 | (159.0) |
| MV12 | | | 5.00 | (127.0) |
| TW12 | | | 5.00 | (127.0) |

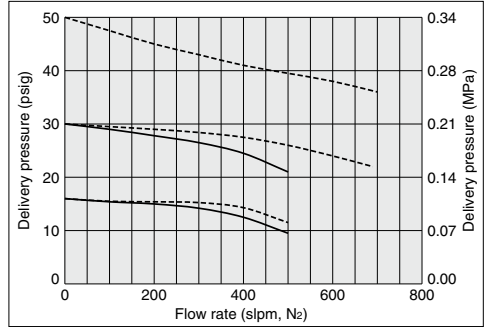
Wetted Parts Material

| 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 Rate Characteristics

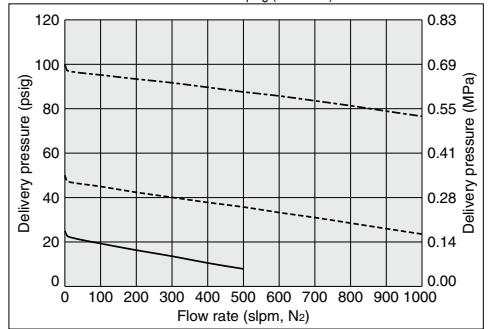
Inlet pressure: ---- 80 psig (0.55 MPa) — 60 psig (0.41 MPa)
1/2 inch connections *)

AP1200



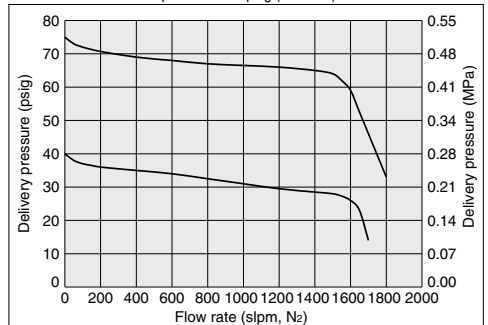
AP1200HF

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

AP1100 Series

- 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

Port Number

① ② ③ ④

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 | 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 |

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) |

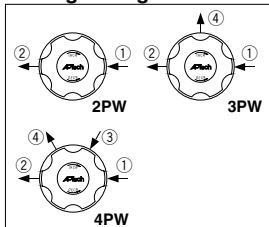
*3) PTFE recommended for applications such as within a process tool.

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.

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 |

Sample Order Number

| Port | ① | ② | ③ | ④ |
|---------|-----|-----|-----|----|
| AP1101S | FV4 | FV4 | | |
| | 3PW | FV4 | FV4 | 0 |
| | 3PW | FV4 | FV4 | V3 |
| | 4PW | FV4 | FV4 | V3 |
| | 4PW | FV4 | FV4 | 0 |

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 | 1.5 times the maximum source pressure |
| | Outlet | 1.5 times the maximum delivery pressure |
| Burst pressure | Inlet | 3 times the maximum source pressure |
| | Outlet | 3 times the maximum delivery pressure |
| 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.

Single Stage Regulator for Ultra High Purity **AP1100 Series**

Delivery of sub-atmospheric pressure

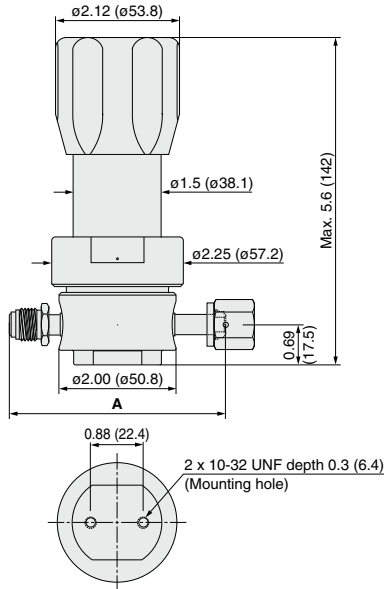
Wetted Parts Material

| 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 | PTFE (Option: PTFE) | | | |

Dimensions

inch (mm)

AP1100

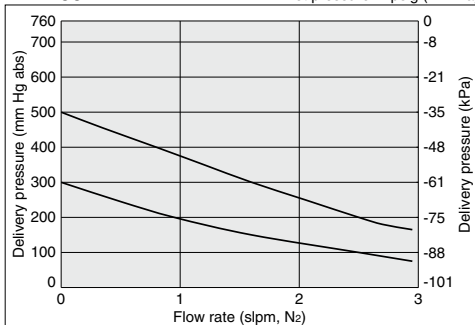


| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 3.70 | (94.0) |
| MV4 | 3.70 | (94.0) |
| TW4 | 2.96 | (75.2) |
| FV6 | 4.70 | (119.4) |
| MV6 | 4.70 | (119.4) |
| TW6 | 2.96 | (75.2) |

Flow Rate 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)

AP1700 Series

- 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) |

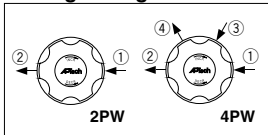
Material

| Code | Body | Poppet | Diaphragm | Nozzle |
|------|--------------------------|----------------|----------------|----------------|
| S | 316L SS secondary remelt | 316L SS | 316L SS | 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) |

Porting Configuration



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

Ports

| Code | Ports |
|------|---------|
| 2PW | 2 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) | |
|---------|---|-----------------|
| | 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.752) for gauge specifications.
Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Sample Order Number

| AP1702S | Port ① | ② | ③ | ④ |
|---------|--------|-----|----|----|
| 2PW | FV4 | FV4 | | |
| 4PW | FV4 | FV4 | 0 | 0 |
| 4PW | FV4 | FV4 | 40 | V3 |

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 | 1.5 times the maximum source pressure | |
| | Outlet | 1.5 times the maximum delivery pressure | |
| Burst pressure | Inlet | 3 times the maximum source pressure | |
| | Outlet | 3 times the maximum delivery pressure | |
| 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.

Two Stage Regulator for Ultra High Purity **AP1700 Series**

Low flow (Tied-diaphragm)

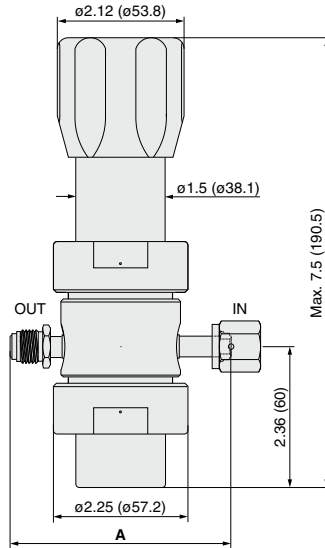
Wetted Parts Material

| 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

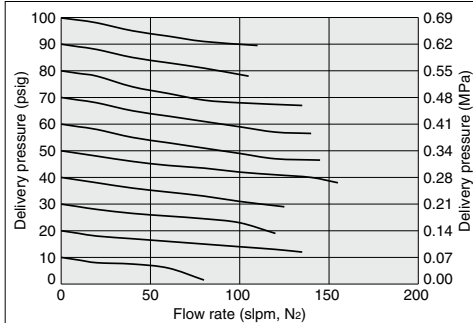


| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 3.70 | (94.0) |
| MV4 | 2.96 | (75.2) |
| FV6 | 4.70 | (119.4) |
| MV6 | 2.96 | (75.2) |

Flow Rate 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.

AP

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Two Stage Regulator for Ultra High Purity

Intermediate flow
(Tied-diaphragm)

AP2700 Series

- 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



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 (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 |

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} |

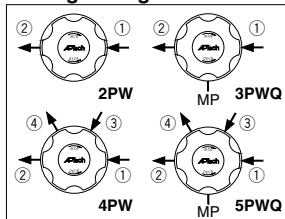
^{(*)3} Not available with SH material.

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



① IN ② OUT ③ Gauge port (Inlet) ④ Gauge port (Outlet) MP=Monitoring gauge port

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 |

^{(*)1} Refer to gauge guide (P.752) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Sample Order Number

| 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 | 1.5 times the maximum source pressure | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | |
| | Outlet | 3 times the maximum delivery pressure | | | |
| 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 **AP2700 Series**

Intermediate flow (Tied-diaphragm)

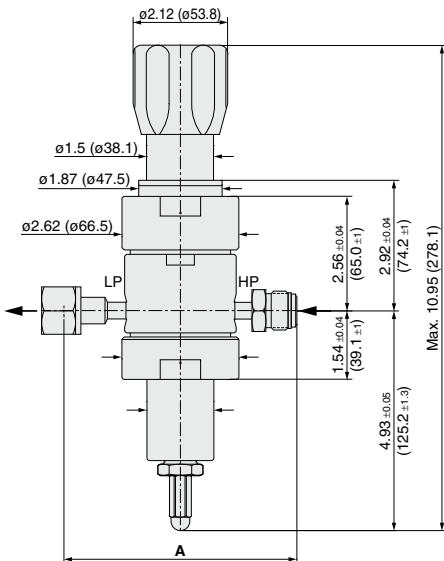
Wetted Parts Material

| 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) |

AP

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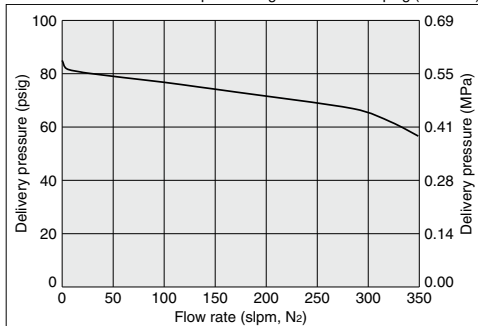
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Flow Rate Characteristics

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

AP9000 & 9100 Series

- 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 | PTFE (Standard) |
| VS | Polyimide |

Pressure gauge unit^{*2)}

| Code | Unit |
|---------|----------|
| No code | psig/bar |
| MPA | MPa |

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 |

Porting Configuration

① IN ② OUT ③ Gauge port (Outlet)

Sample Order Number

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

^{*1)} Refer to gauge guide (P.752) for gauge specifications.
^{*2)} Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

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 | 1.5 times the maximum source pressure | | |
| | Outlet | 1.5 times the maximum delivery pressure | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | |
| | Outlet | 3 times the maximum delivery pressure | | |
| 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·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 ^{*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 in ³ (197 cm ³) | | | |
| 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

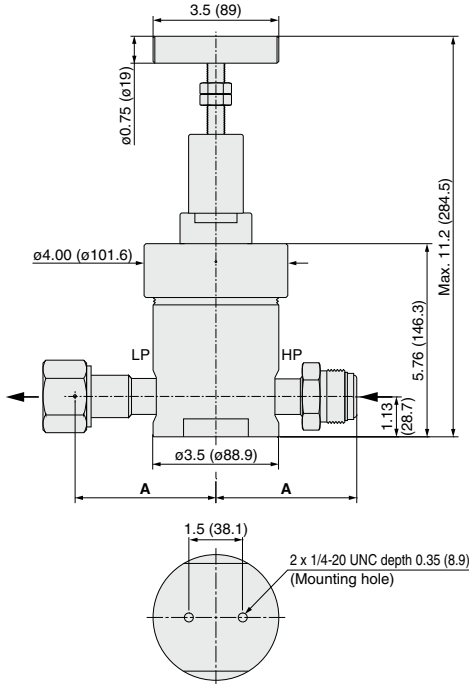
| Wetted Parts | S |
|----------------|--|
| Body | 316L SS |
| Surface finish | Electropolish + Passivation |
| Poppet | Ni-Cr-Mo alloy |
| Bellows | Ni-Cr-Mo alloy |
| Nozzle | 316L SS |
| Seat | PCTFE (Option: Polyimide) |
| Poppet spring | Ni-Co alloy |
| Bonnet seal | Nickel 200 ^{*)} (Silver plated)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

^{*)} 316 SS silver plated for AP9030

Dimensions

inch (mm)

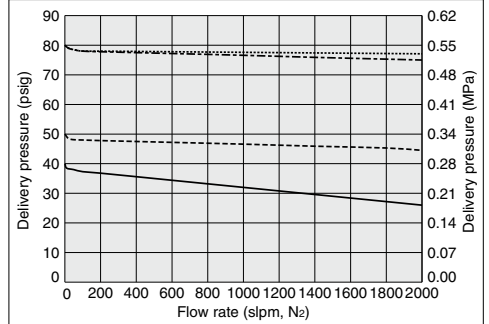
AP9000 & 9100



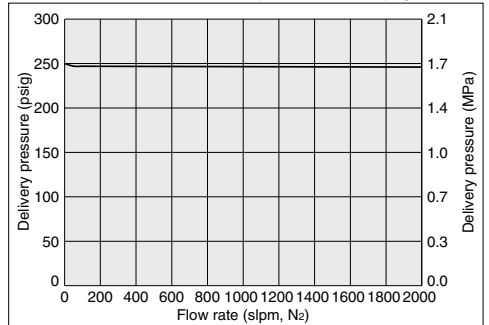
| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV8 | 3.11 | (79.0) |
| MV8 | 3.11 | (79.0) |
| TW8 | 4.75 | (120.7) |
| FV12 | 3.64 | (92.5) |
| MV12 | 3.64 | (92.5) |
| TW12 | 4.75 | (120.7) |
| FV16 | 3.92 | (99.6) |
| MV16 | 3.92 | (99.6) |
| TW16 | 4.75 | (120.7) |

Flow Rate Characteristics

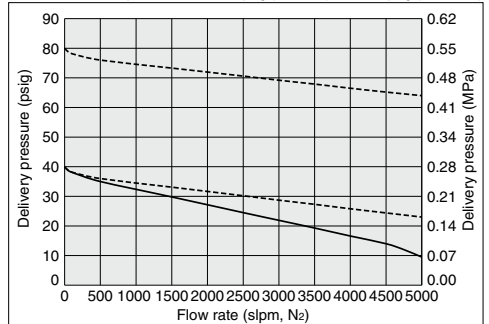
AP9010 Inlet pressure: 1000 psig (6.9 MPa) --- 300 psig (2.1 MPa)
----- 200 psig (1.4 MPa) — 75 psig (0.52 MPa)



AP9030 Inlet pressure: — 600 psig (4.1 MPa)



AP9110 Inlet pressure: ---- 150 psig (1.0 MPa) — 75 psig (0.52 MPa)



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

AP

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Single Stage Compact Regulator for Ultra High Purity

SL5200 Series

- 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

| 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 |
| S | 316L SS | 316L SS |
| SH | secondary remelt | Ni-Cr-Mo alloy |
| | | Diaphragm |
| | | 316L SS |

| Surface finish | |
|----------------|------------------------------------|
| Code | Surface finish Ra max |
| No code | 15 μ m. (0.4 μ m) Standard |
| M | 10 μ m. (0.25 μ m) |
| V | 7 μ m. (0.18 μ m) |
| X | 5 μ m. (0.13 μ m) |

| Range options *1) | |
|-------------------|-----------------|
| Code | Specification |
| No code | Standard |
| A | Sub-atmospheric |

*1) Only available with SL5201.

| 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) | |
|---------|-----------------------------------|-----------------|
| | psig/bar unit | MPa unit |
| No code | No gauge port | |
| 0 | 1/4 inch face seal (Male) | |
| FV4 | 1/4 inch face seal (Female) | |
| 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) Refer to gauge guide (P.752) 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) |

*5) Panel mounting hole: dia. 1.25 inch (31.8 mm).

| Option | |
|---------|---------------|
| Code | Specification |
| No code | Standard |
| HF | High flow |

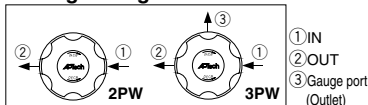
| Seat material | |
|---------------|------------------|
| Code | Material |
| No code | PCTFE (Standard) |
| VS | Polyimide *4) |

*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



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 | 1.5 times the maximum source pressure | | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | | |
| | Outlet | 3 times the maximum delivery pressure | | | | |
| 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 μ m. (0.25 μ m) Option: 7 μ m. (0.18 μ m), 5 μ m. (0.13 μ m) | | | | |
| 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 **SL5200 Series**

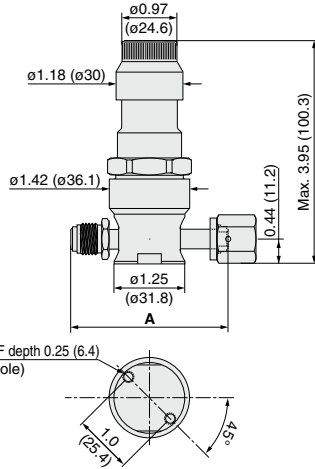
Wetted Parts Material

| 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 | 3.86 | (98.0) |
| FV6 | 2.65 | (67.3) |
| MV6 | | |
| TW6 | | |

AP

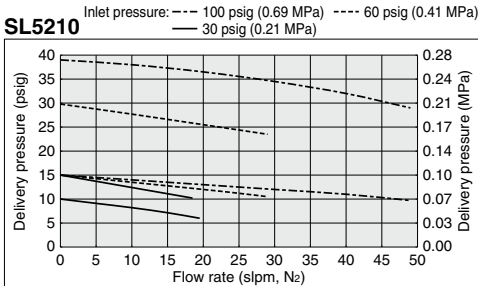
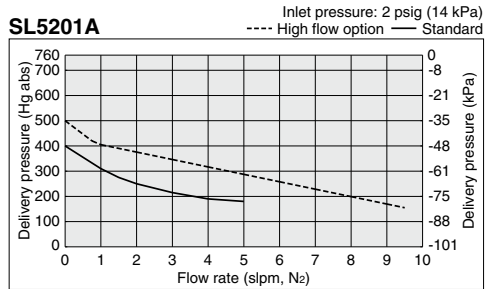
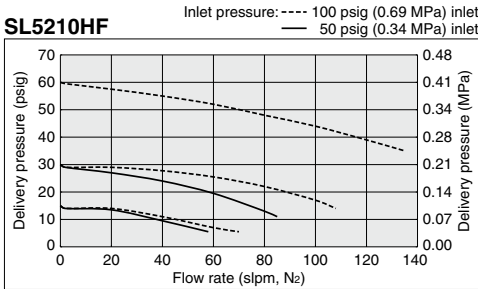
SL

AZ

AK

BP

Flow Rate 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 Low flow

SL5500 Series

- 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

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 secondary remelt | 316L SS | 316L SS |
| SH | | Ni-Cr-Mo alloy | Ni-Cr-Mo alloy |

Surface finish

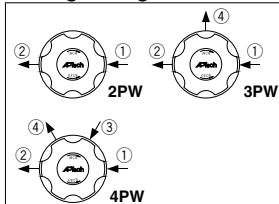
| Code | Surface finish Ra max |
|------|---------------------------|
| M | 10 μm. (0.25 μm) Standard |
| V | 7 μm. (0.18 μm) |
| X | 5 μm. (0.13 μm) |

Range options *1)

| Code | Specification |
|---------|-----------------|
| No code | Standard |
| A | Sub-atmospheric |

*1) Only available with SL5502.

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)

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 *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.752) for gauge specifications.
Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Sample Order Number

| SL55 | Port | ① | ② | ③ | ④ |
|------|------|----|----|----|-------|
| | 2PW | ** | ** | | |
| | 3PW | ** | ** | 0 | |
| | 3PW | ** | ** | 1 | 1 MPa |
| | 4PW | ** | ** | 0 | 0 |
| | 4PW | ** | ** | 40 | 1 MPa |

Bonnet option

| Code | Bonnet |
|---------|------------------------|
| No code | Standard |
| P | Panel installation *5) |

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

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.

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 | 1.5 times the maximum source pressure | | |
| | Outlet | 1.5 times the maximum delivery pressure | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | |
| | Outlet | 3 times the maximum delivery pressure | | |
| 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 μm. (0.25 μm) Option: 7 μm. (0.18 μm), 5 μm. (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) pressure 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.

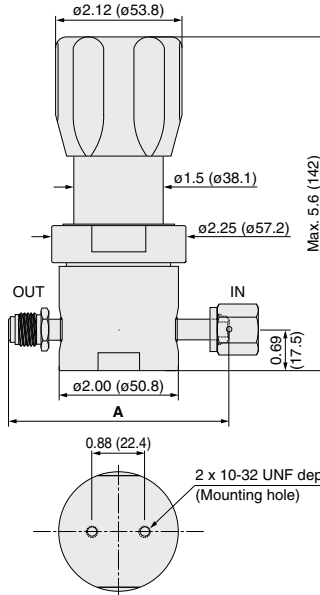
Wetted Parts Material

| 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

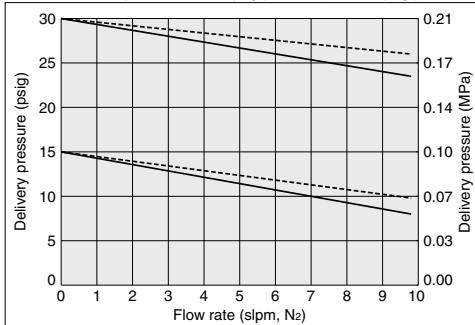


| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 3.70 | (94.0) |
| MV4 | 2.96 | (75.2) |
| TW4 | 4.70 | (119.4) |
| FV6 | 2.96 | (75.2) |
| MV6 | | |
| TW6 | | |

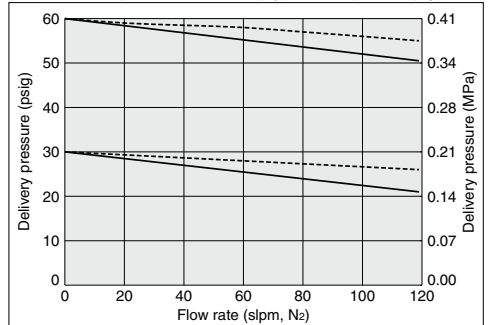
AP
SL
 AZ
 AK
 BP

Flow Rate 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

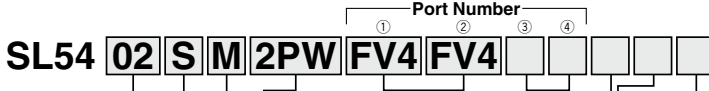
SL5400 Series

- 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



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 |
| SH | | Ni-Cr-Mo alloy | |

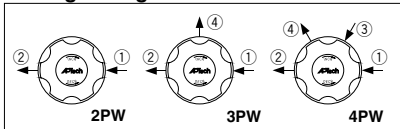
Surface finish

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

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.752).

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 *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

| SL54 | Port | ③ | ④ |
|---------|------|----|-------|
| ** ** * | 2PW | ** | ** |
| ** ** * | 3PW | ** | 0 |
| ** ** * | 3PW | ** | 1 MPa |
| ** ** * | 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 | 1.5 times the maximum source pressure | |
| | Outlet | 1.5 times the maximum delivery pressure | |
| Burst pressure | Inlet | 3 times the maximum source pressure | |
| | Outlet | 3 times the maximum delivery pressure | |
| 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.

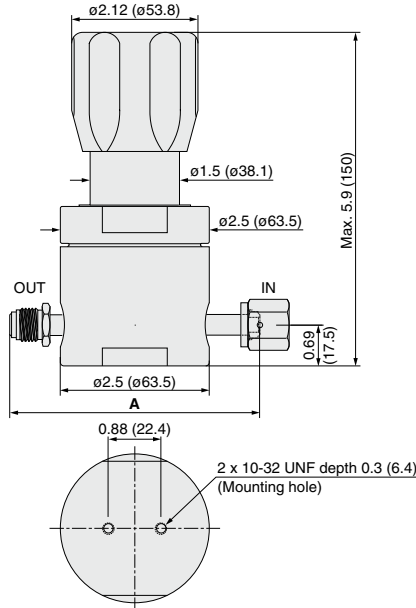
Wetted Parts Material

| 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

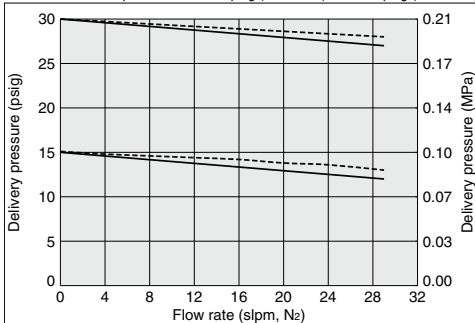


| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 4.30 | (109.2) |
| MV4 | 3.46 | (87.9) |
| TW4 | 5.22 | (132.6) |
| FV6 | 4.00 | (101.6) |
| MV6 | 5.22 | (132.6) |
| TW6 | 4.00 | (101.6) |
| FV8 | 5.22 | (132.6) |
| MV8 | 4.34 | (110.2) |
| TW8 | 4.34 | (110.2) |

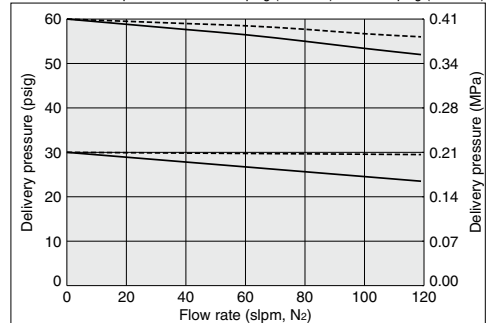
- AP
- SL**
- AZ
- AK
- BP

Flow Rate 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

SL5800 Series

- 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 |

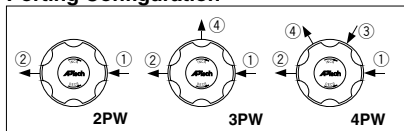
Surface finish

| 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 (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 |
| 4 | 0 to 400 psig | 0 to 3 MPa |

*1) Other range available. Refer to gauge guide (P.752).

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

| SL58 | Port | ③ | ④ |
|------|------|---|-------|
| *** | 2PW | * | * |
| *** | 3PW | * | 0 |
| *** | 3PW | * | 1 MPA |
| *** | 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 | 1.5 times the maximum source pressure | | |
| | Outlet | 1.5 times the maximum delivery pressure | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | |
| | Outlet | 3 times the maximum delivery pressure | | |
| 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.

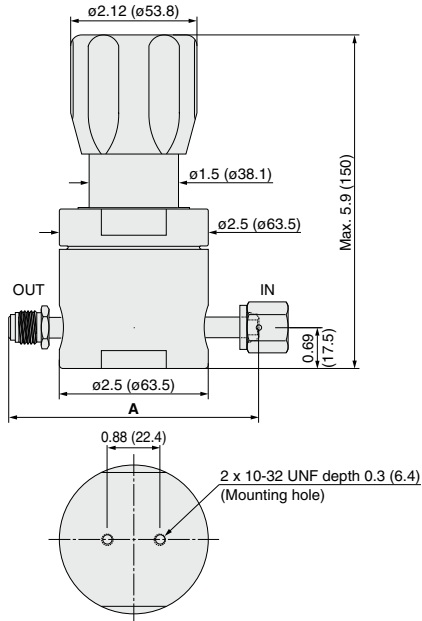
Wetted Parts Material

| 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



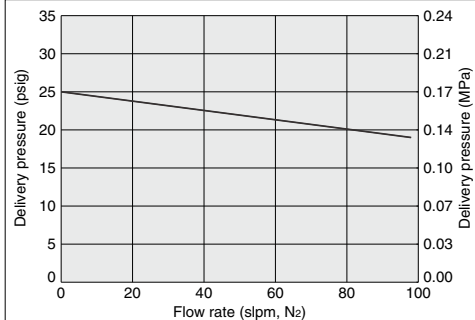
| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 4.30 | (109.2) |
| MV4 | 4.30 | (109.2) |
| TW4 | 3.46 | (87.9) |
| FV6 | 5.22 | (132.6) |
| MV6 | 5.22 | (132.6) |
| TW6 | 4.00 | (101.6) |
| FV8 | 5.22 | (132.6) |
| MV8 | 5.22 | (132.6) |
| TW8 | 4.34 | (110.2) |

AP
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BP

Flow Rate Characteristics

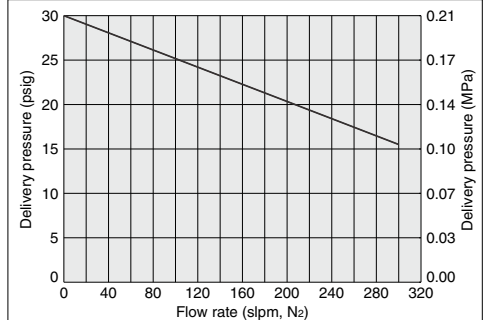
SL5800

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

AZ1000 Series

- 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



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 |

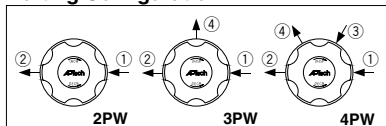
Surface finish

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

*1 Refer to gauge guide (P.752) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

Sample Order Number

| AZ1001S | Port ① | ② | ③ | ④ |
|---------|--------|-----|----|-----|
| 2PW | FV4 | FV4 | | |
| 3PW | FV4 | FV4 | V3 | MPA |
| 4PW | FV4 | FV4 | V3 | MPA |
| 4PW | FV4 | FV4 | 0 | 0 |

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.

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 | 1.5 times the maximum source pressure | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | |
| | Outlet | 3 times the maximum delivery pressure | | | |
| 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 μm. (0.25 μm) Option: 25 μm. (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 in ³ (8 cm ³) | | | | |
| 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.

Single Stage Regulator for Ultra High Purity **AZ1000 Series**

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 | 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 | | | | |

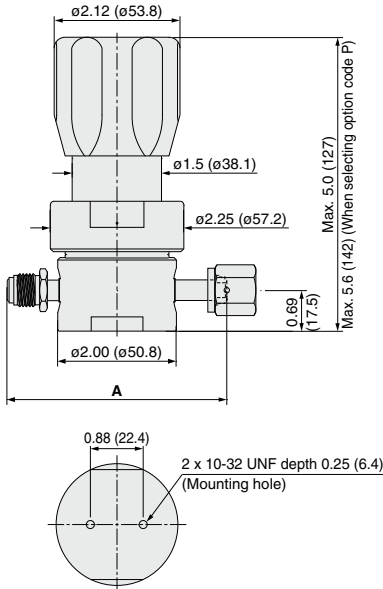
Wetted Parts Material

| 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

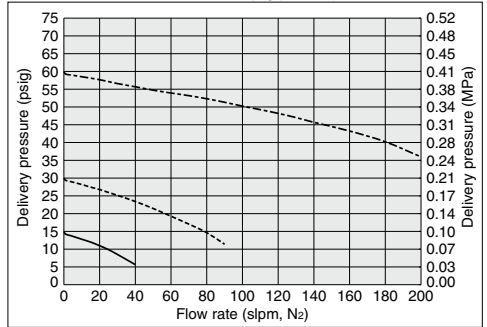


| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 3.70 | (94.0) |
| MV4 | 3.70 | (94.0) |
| FV6 | 4.70 | (119.4) |
| MV6 | 4.70 | (119.4) |
| TW6 | 2.96 | (75.2) |

Flow Rate Characteristics

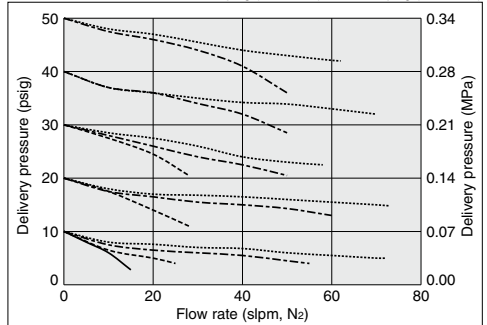
Inlet pressure: --- 100 psig (0.69 MPa) ---- 50 psig (0.34 MPa)
 — 30 psig (0.21 MPa)

AZ1000HF



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.

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Single Stage Regulator for Ultra High Purity

Low flow
(Tied-diaphragm)

AZ1500 Series

- 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
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 | |
| SHP | 316L SS | Ni-Cr-Mo alloy | Ni-Cr-Mo alloy | 316L SS |

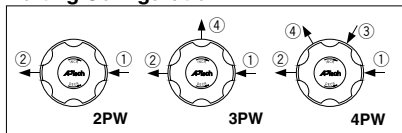
Surface finish

| 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 |

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) |
| 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 |
| 40 | 0 to 4000 psig | 0 to 28 MPa |

*1) Refer to gauge guide (P.752) 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 *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.

Sample Order Number

| AZ1510S | Port | | | |
|---------|------|-----|----|-------|
| | ① | ② | ③ | ④ |
| 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 | 1.5 times the maximum source pressure | | |
| | Outlet | 1.5 times the maximum delivery pressure | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | |
| | Outlet | 3 times the maximum delivery pressure | | |
| 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.

Single Stage Regulator for Ultra High Purity **AZ1500 Series**

Low flow (Tied-diaphragm)

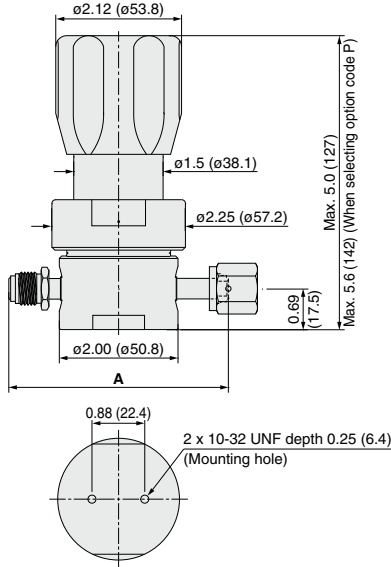
Wetted Parts Material

| 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)

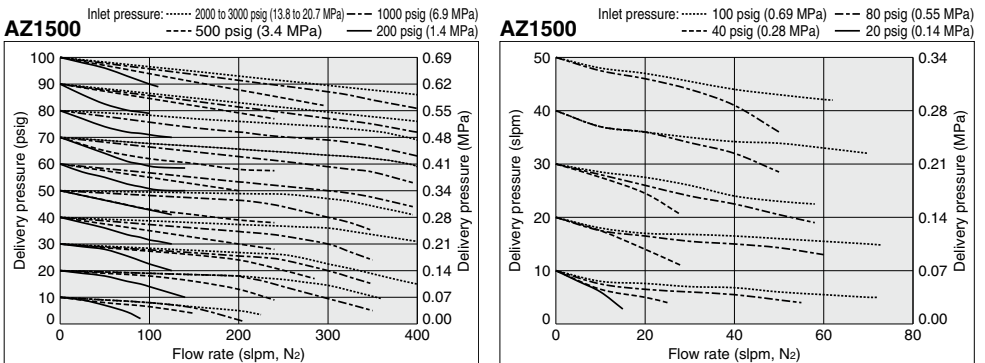
AZ1500



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

AP
SL
AZ
AK
BP

Flow Rate 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)

AZ1400T Series

- 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**

| 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) |

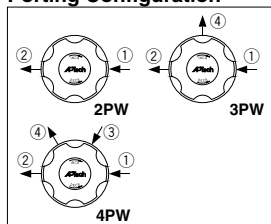
| Material | | |
|----------|---------|----------------|
| Code | Body | Poppet |
| S | 316L SS | Ni-Cr-Mo alloy |
| | | Ni-Cr-Mo alloy |

| 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.

Porting Configuration



| Code | Ports |
|------|---------|
| 2PW | 2 ports |
| 3PW | 3 ports |
| 4PW | 4 ports |

- 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) |
| 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) | |
|---------|--|-----------------|
| | 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.732) 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 |
| AZ1402TS | 2PW/FV4/FV4 | | |
| | 3PW/FV4/FV4 | 0 | |
| | 3PW/FV4/FV4 | | 1 MPa |
| | 4PW/FV4/FV4 | 40 | 1 MPa |
| | 4PW/FV4/FV4 | 0 | 0 |

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.

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 | 1.5 times the maximum source pressure | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | |
| | Outlet | 3 times the maximum delivery pressure | | | |
| Ambient and operating temperature | -40 to 71°C (No freezing) *2) | | | | |
| 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 *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) | | | | |
| 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 in ³ (17.4 cm ³) | | | | |
| 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 **AZ1400T Series**

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) | |

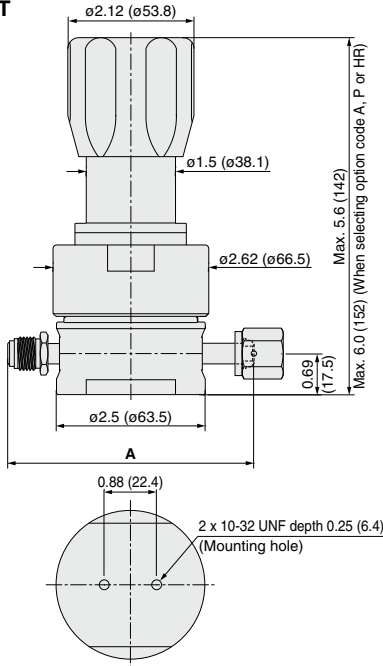
Wetted Parts Material

| 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)

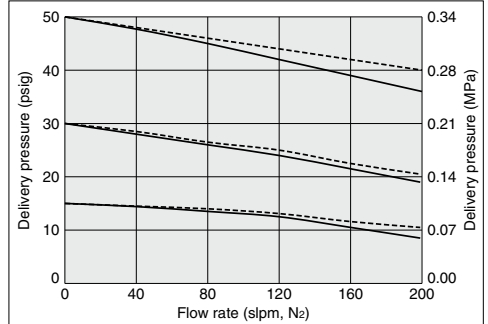
AZ1400T



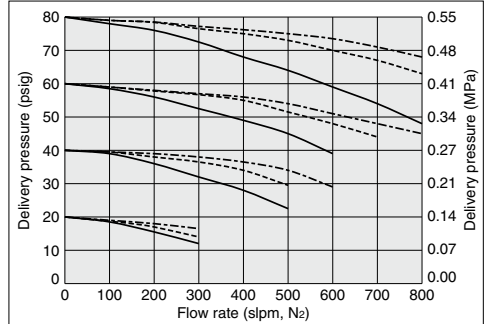
| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 4.30 | (109.2) |
| MV4 | | |
| FV6 | 5.22 | (132.6) |
| MV6 | | |
| TW6 | 4.00 | (101.6) |
| FV8 | 5.22 | (132.6) |
| MV8 | | |
| TW8 | 4.34 | (110.2) |

Flow Rate Characteristics

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

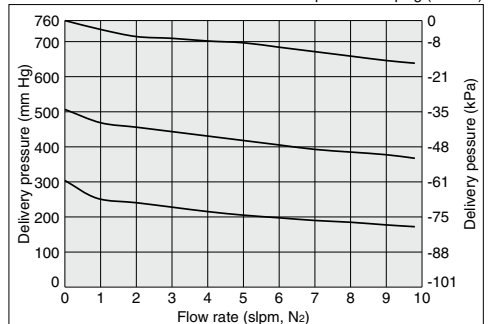


AZ1400T Inlet pressure: - - - - 2000 psig (13.8 MPa) - - - - 600 psig (4.1 MPa) — 200 psig (1.4 MPa)



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.

AP

SL

AZ

AK

BP

Single Stage Regulator for Ultra High Purity High flow

AZ1300 Series

- 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) |

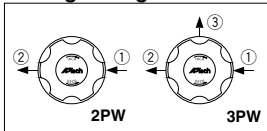
^{*4)} Panel mounting hole: dia. 1.56 inch (39.6 mm).

Seat material

| Code | Material |
|---------|---------------------|
| No code | PCTFE (Standard) |
| TF | PTFE ^{*3)} |

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

Porting Configuration



① IN ② OUT ③ Gauge port (Outlet)

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.752) 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.

Sample Order Number

| Part | ① | ② | ③ |
|---------|-----|-----|--------|
| AZ1302S | 2PW | FV8 | FV8 |
| | 3PW | FV8 | 0 |
| | 3PW | FV8 | V3 MPA |

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 | 1.5 times the maximum source pressure | | |
| | Outlet | 1.5 times the maximum delivery pressure | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | |
| | Outlet | 3 times the maximum delivery pressure | | |
| 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.

Single Stage Regulator for Ultra High Purity **AZ1300 Series**

High flow

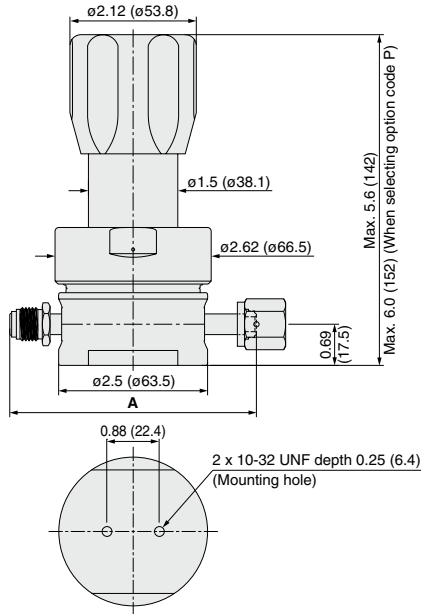
Wetted Parts Material

| 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



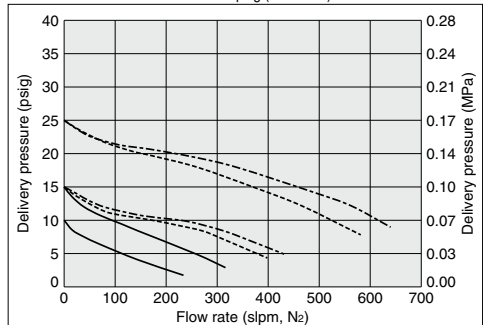
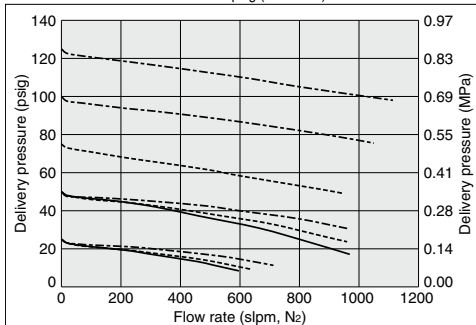
| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 4.30 | (109.2) |
| MV4 | 4.30 | (109.2) |
| FV6 | 5.22 | (132.6) |
| MV6 | 5.22 | (132.6) |
| TW6 | 4.00 | (101.6) |
| FV8 | 5.22 | (132.6) |
| MV8 | 5.22 | (132.6) |
| TW8 | 4.34 | (110.2) |

- AP
- SL
- AZ**
- AK
- BP

Flow Rate 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)

AZ1200 Series

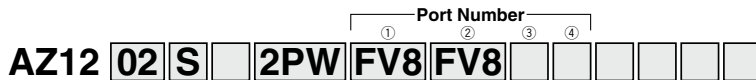
- For UHP gas delivery
- High inlet pressure type Standard: Max. 1700 psig (11.7 MPa)
HR (option): Max. 3000 psig (20.7 MPa)
- Flow capacity Standard to 800 slpm
HF (option): to 1000 slpm
FC (option): to 1500 slpm

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



ROHS

How to Order



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 | 316L SS | Ni-Cr-Mo alloy | Ni-Cr-Mo alloy |

Surface finish

| Code | Surface finish Ra |
|---------|---------------------------|
| No code | 10 μm. (0.25 μm) Standard |
| Q | 25 μm. (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 |

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) |

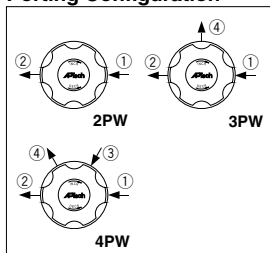
*3) Not available with SHP material.

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)

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.752) 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 | | |
|---------|---------|-----|----------|
| | ① | ② | ③ ④ |
| AZ1210S | 2PW | FV8 | FV8 |
| | 3PW | FV8 | 0 |
| | 3PW | FV8 | 1 MPa |
| | 4PW | 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 | 1.5 times the maximum source pressure | | | | |
| Outlet | 1.5 times the maximum delivery pressure | | | | |
| Inlet | 3 times the maximum source pressure | | | | |
| Outlet | 3 times the maximum delivery pressure | | | | |
| Ambient and operating temperature | -40 to 71°C (No freezing) *3) | | | | |
| Cv | 0.65 | | | | |
| Leak rate | 2 x 10 ⁻¹¹ Pa·m ³ /s | | | | |
| Inboard leakage | 2 x 10 ⁻¹⁰ Pa·m ³ /s *4) | | | | |
| Outboard leakage | 4 x 10 ⁻⁹ Pa·m ³ /s *5) | | | | |
| Across the seat leak | Face seal, Tube weld | | | | |
| Surface finish | Ra 10 μm. (0.25 μm) Option: 25 μm. (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 in ³ (17.6 cm ³) | | | | |
| 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.

Single Stage Regulator for Ultra High Purity **AZ1200 Series**

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 | 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

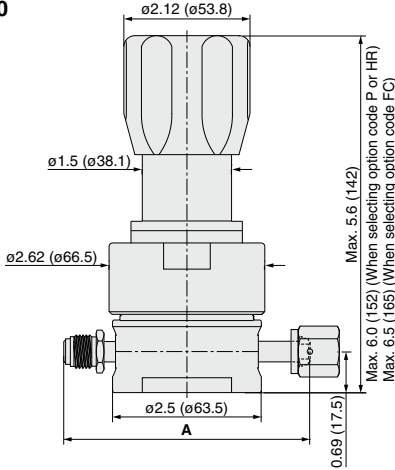
Changes from the standard type are:

| Option | Other Parameters | AZ1210 | AZ1215 |
|-----------|------------------------|--------------------------------|--------|
| HR | Source pressure | Vacuum to 3000 psig (20.7 MPa) | |

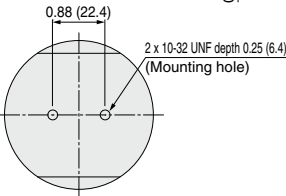
Dimensions

inch (mm)

AZ1200



| 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) |

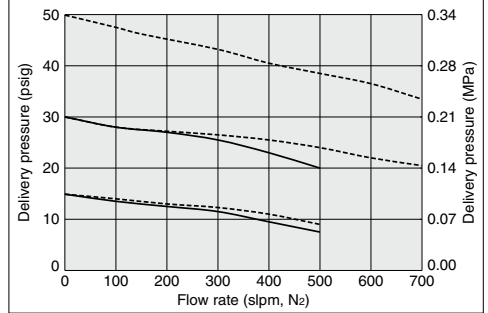


Wetted Parts Material

| 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 Rate Characteristics

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



AP

SL

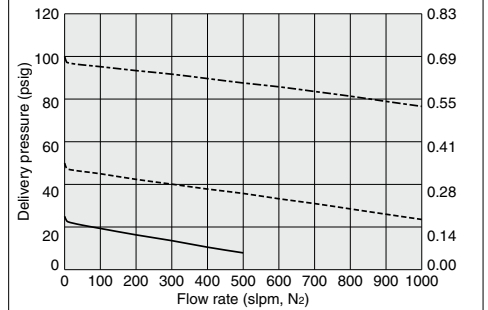
AZ

AK

BP

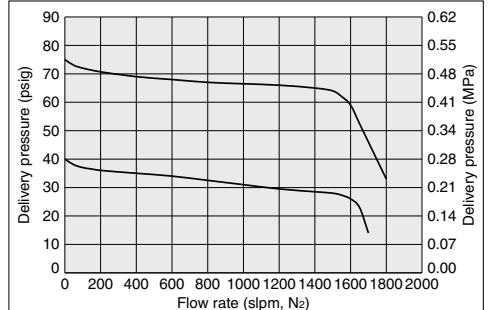
AZ1200HF

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 rate 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)

AZ9200 Series

- 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) |

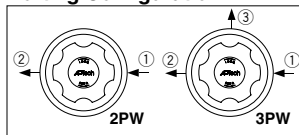
Material*

| 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 (Inlet ①, Outlet ②)*

| 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)} (Outlet ③)

| 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.752).

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 | 1.5 times the maximum source pressure | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | |
| | Outlet | 3 times the maximum delivery pressure | | | |
| 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 μm (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).

Single Stage Regulator for Ultra High Purity **AZ9200 Series**

High flow(Tied-diaphragm)

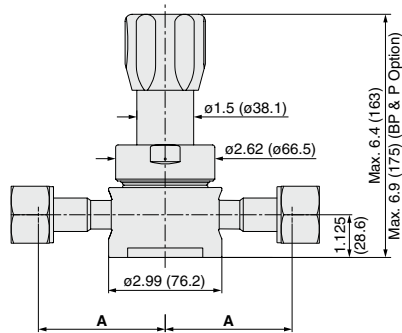
Wetted Parts Material

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

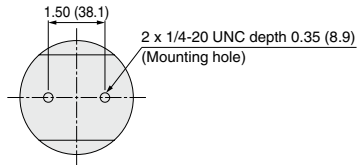
Dimensions

inch (mm)

AZ9200



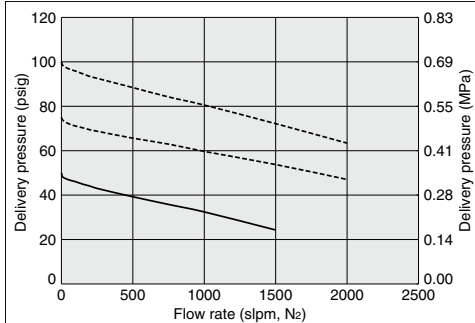
| Connections | A | |
|-------------|------|--------|
| | inch | (mm) |
| FV12 | 3.39 | (86.1) |
| MV12 | 3.00 | (76.2) |
| TW12 | 3.67 | (93.2) |
| FV16 | 3.00 | (76.2) |
| MV16 | 3.00 | (76.2) |
| TW16 | 3.00 | (76.2) |



AP
SL
AZ
AK
BP

Flow Rate 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

AZ1100 Series



- 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
① ② ③ ④

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 | |
| SHP | 316L SS | Ni-Cr-Mo alloy | Ni-Cr-Mo alloy | 316L SS |

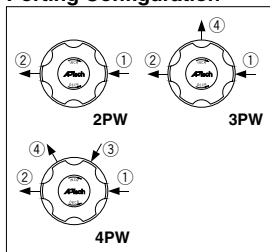
Surface finish

| 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 |

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) |
| 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 |
|---------|-----|-----|-----|-----------|
| AZ1101S | 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) |
| 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, Outlet ④)

| Code | Pressure gauge unit *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.752).
Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

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 | 1.5 times the maximum source pressure |
| | Outlet | 1.5 times the maximum delivery pressure |
| Burst pressure | Inlet | 3 times the maximum source pressure |
| | Outlet | 3 times the maximum delivery pressure |
| 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.

Single Stage Regulator for Ultra High Purity **AZ1100 Series**

Delivery of sub-atmospheric pressure

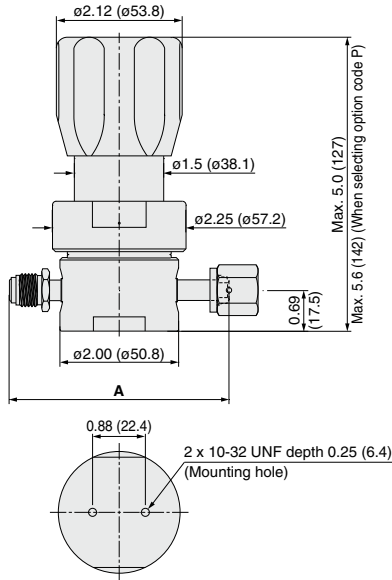
Wetted Parts Material

| 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

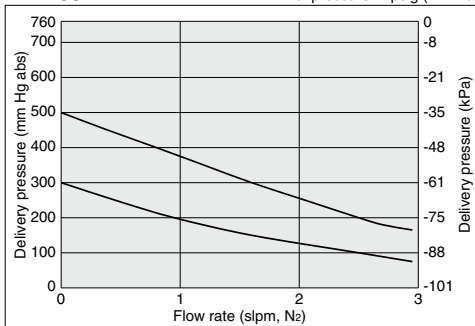


| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 3.70 | (94.0) |
| MV4 | 3.70 | (94.0) |
| FV6 | 4.70 | (119.4) |
| MV6 | 4.70 | (119.4) |
| TW6 | 2.96 | (75.2) |

Flow Rate 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

AK1000 Series

- 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



How to Order

AK10 01 S 4PL 4 4 0 0

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

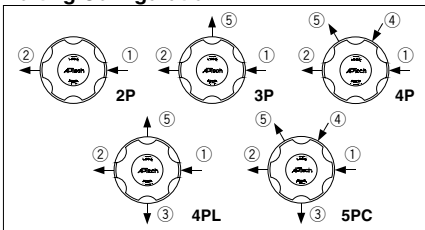
| Ports | | | |
|-------|-------|----------|-------|
| Code | Ports | Material | S, SH |
| 2P | | | ● |
| 3P | | | ● |
| 4P | | | ● |
| 4PL | | | ● |
| 5PC | | | ● |

| Connections (Inlet ①, Outlet ②) | |
|---------------------------------|----------------------|
| 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 (0.034 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



| 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.

Bonnet option

| | |
|---------|------------------------|
| Code | Bonnet |
| No code | Standard |
| P | Panel installation *6) |

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

Option

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

Gauge port

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

| Pressure gauge *1) | | |
|--------------------|---|-----------------|
| 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 |
| 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.752) 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.

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

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.

Sample Order Number

| AK1002S | Port | | | | |
|---------|------|---|---|----|--------|
| | ① | ② | ③ | ④ | ⑤ |
| 2P | 4 | 4 | | | |
| 3P | 4 | 4 | | V3 | MPa |
| 4P | 4 | 4 | | 1 | V3 MPa |
| 4PL | 4 | 4 | 0 | 1 | V3 MPa |
| 4PL | 4 | 4 | 0 | | 0 |
| 5PC | 4 | 4 | 0 | 1 | V3 MPa |

Specifications

| Operating Parameters | AK1001 | AK1002 | AK1006 | AK1010 | AK1015 | AK1020 | AK1030 | AK1050 |
|-----------------------------------|--|---|------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Delivery pressure | 0.5 to 10 psig (0.034 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 | 1.5 times the maximum source pressure | | | | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | | | | |
| | Outlet | 3 times the maximum delivery pressure | | | | | | |
| 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 | | | | | | | |
| 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 | 1.09 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.

Single Stage Regulator for General Applications **AK1000 Series**

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 | 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 | | | | | | | |

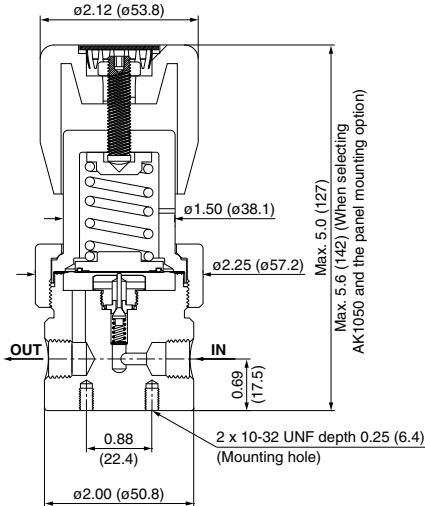
Wetted Parts Material

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

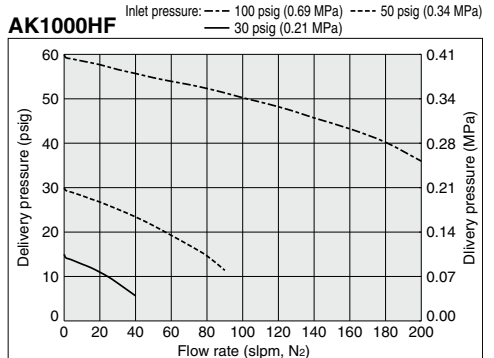
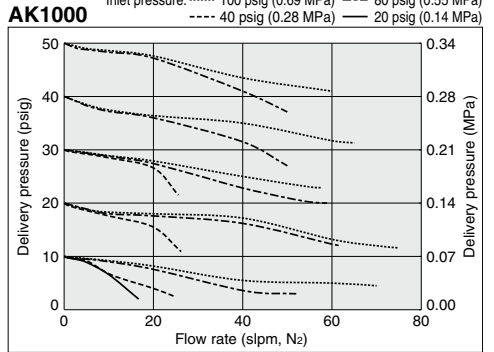
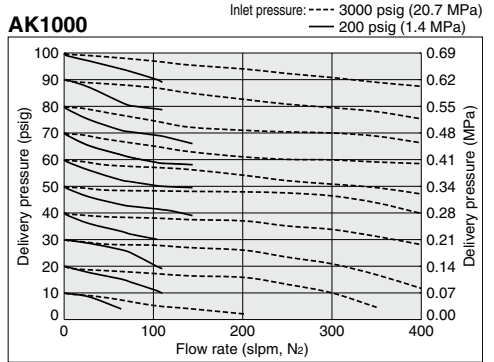
Dimensions

inch (mm)

AK1000



Flow Rate Characteristics



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

AP
SL
AZ
AK
BP

Single Stage Regulator for General Applications

Low flow
(Tied-diaphragm)

AK1500 Series

- 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 | | |
| SH | | Ni-Cr-Mo alloy | Ni-Cr-Mo alloy |

Ports

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

Port Number

① ② ③ ④ ⑤

AK15 02 S 4PL 4 4 0 0

① ② ③ ④ ⑤

Connections

(Inlet ①, Outlet ②)

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

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 | PTFE (Standard) |
| VS | Polyimide ^{(*)3} |
| PK | PEEK |

^{(*)3} Not available with SH material.

Gauge port

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

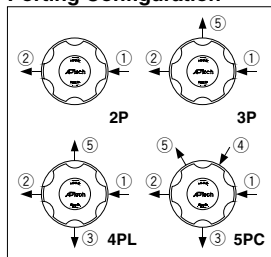
| Code | Pressure gauge ^{(*)1} | |
|---------|---|-----------------|
| | psig/bar unit | MPa unit |
| No code | No gauge port | |
| 0 | No pressure gauge (Gauge port: 1/4 inch NPT) ^{(*)2} | |
| C | No pressure gauge (1/4 inch NPT plug is installed before shipment.) | |
| V3 | -30 in.Hg to 30 psig | -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 |

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 Extra outlet port
- ④ Gauge port (Inlet)
- ⑤ Gauge port (Outlet)

^{(*)1} Refer to gauge guide (P.752) 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.

Sample Order Number

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

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 | 1.5 times the maximum source pressure | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | |
| | Outlet | 3 times the maximum delivery pressure | | | |
| 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.

Single Stage Regulator for General Applications **AK1500 Series**

Low flow (Tied-diaphragm)

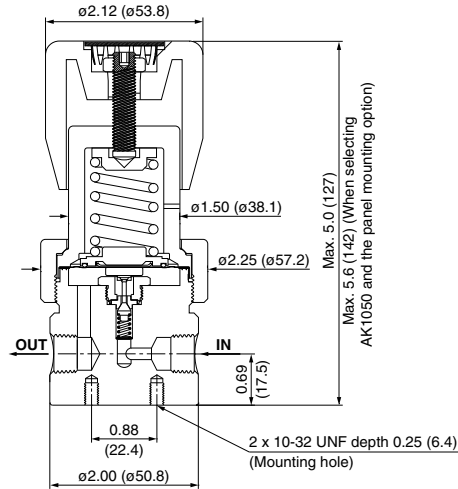
Wetted Parts Material

| 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

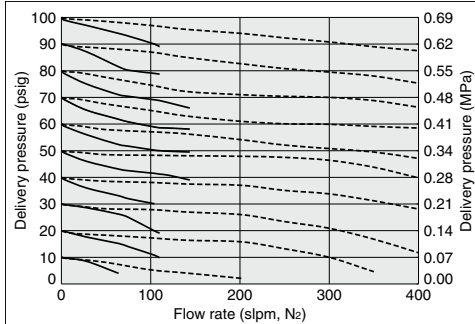


AP
SL
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BP

Flow Rate Characteristics

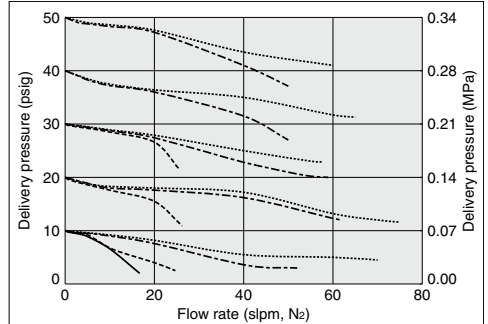
AK1500

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)

AK1400T Series

- 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

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) |

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 | Ni-Cr-Mo alloy | Ni-Cr-Mo alloy |

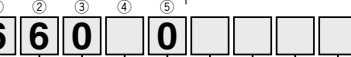
| Code | Ports | Material | |
|------|--------------------------------|----------|-------|
| | | B | S, SH |
| 2P | Refer to the following porting | | ● |
| 3P | | | ● |
| 4PL | | ● | ● |
| 5PC | configurations. | ● | ● |

Range options *1)

| Code | Specification |
|---------|-----------------|
| No code | Standard |
| A | Sub-atmospheric |

*1) Only available with AK1402T.

Port Number



| 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) |
| VS | Polyimide *4) |

*4) Not available with SH material.

Bonnet option

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

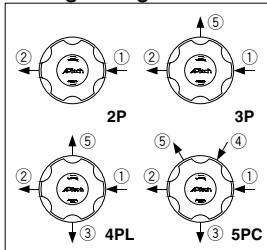
*6) Panel mounting hole: dia. 1.56 inch (39.6 mm).

Option

| Code | Specification |
|---------|---|
| No code | Standard |
| 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 outlet port
- ④ Gauge port (Inlet) ⑤ Gauge port (Outlet)

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 |

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 |

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

| Code | Pressure gauge *2) | |
|---------|--|-----------------|
| | 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.752) 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) |
| 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 | 1.5 times the maximum source pressure | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | |
| | Outlet | 3 times the maximum delivery pressure | | | |
| Ambient and operating temperature | -40 to 71°C (No freezing) *2) | | | | |
| Cv | 0.45 | | | | |
| Leak rate | 1 x 10 ⁻¹⁰ Pa·m ³ /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 in ³ (10.6 cm ³) | | | | |
| 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.

Single Stage Regulator for General Applications

Intermediate flow (Tied-diaphragm) **AK1400T Series**

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) | |

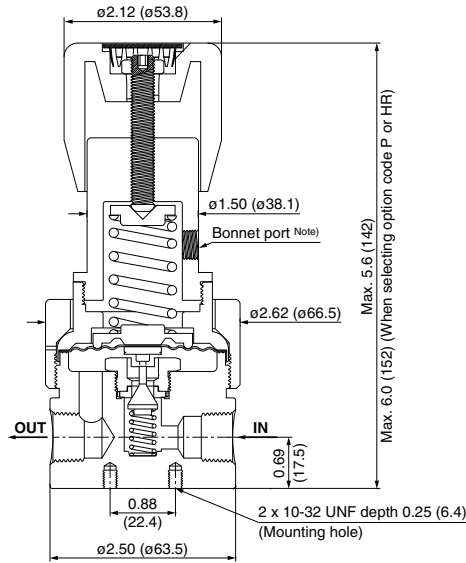
Wetted Parts Material

| 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 | PTFE (Option: Polyimide) | | PTFE |

Dimensions

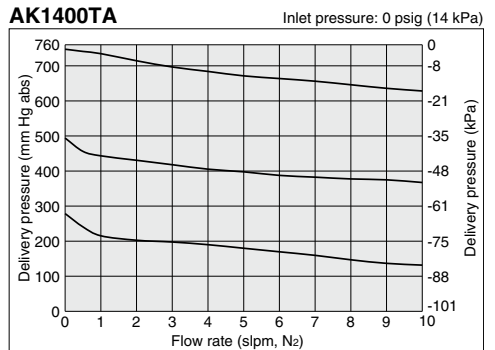
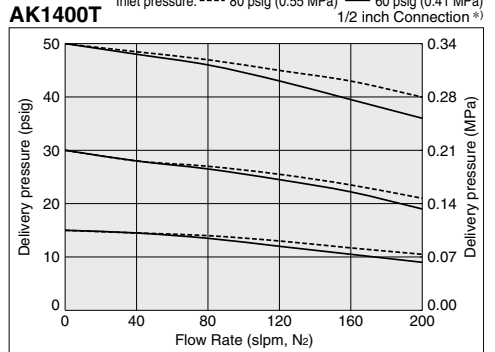
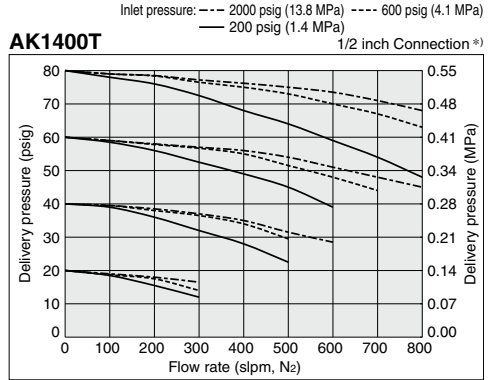
inch (mm)

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 Rate Characteristics



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

- AP
- SL
- AZ
- AK
- BP

AK1300 Series

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



ROHS

How to Order

Port Number
 ① ② ③ ④
AK13 02 S 4PL 8 8 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 | Ni-Cr-Mo alloy |
| S | 316 SS | 316 SS | Ni-Cr-Mo alloy |

Ports

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

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) | |
|---------|---|-----------------|
| | 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 |

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) |

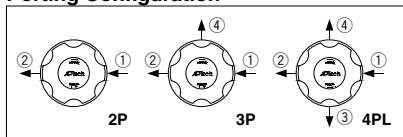
*3) PTFE seats reduce seat abrasion for flow cycle application. Gas permeation is greater with PTFE than PCTFE.

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.

Porting Configuration



① IN ② OUT ③ ④ Gauge port (Outlet)

*1) Refer to gauge guide (P.752) 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.

Sample Order Number

| 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 | 1.5 times the maximum source pressure | | |
| | Outlet | 1.5 times the maximum delivery pressure | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | |
| | Outlet | 3 times the maximum delivery pressure | | |
| 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.

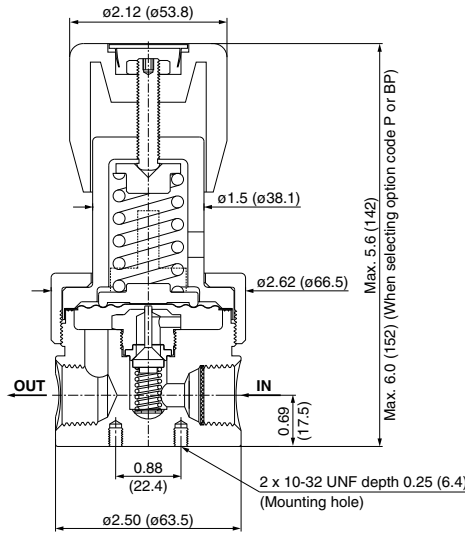
Wetted Parts Material

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

Dimensions

inch (mm)

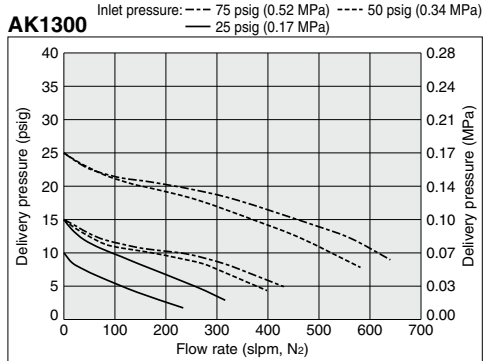
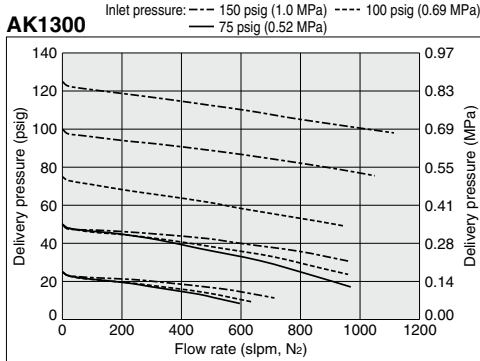
AK1300



- AP
- SL
- AZ
- AK**
- BP

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

Flow Rate 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)

AK1200 Series

- 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

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 |
| | | B S, SH |
| 2P | Refer to the following porting configurations. | ● |
| 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).

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 |

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

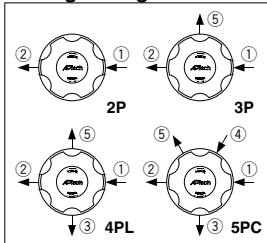
Option

| Code | Specification |
|---------|--|
| No code | Standard (Cv: 0.65) |
| HF | High flow (Cv: 1.1) |
| 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.

Porting Configuration



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

Gauge port (Extra outlet port 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 |

Seat material

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

*3) Not available with SH material.

Sample Order Number

| AK1202S | Port | ① ② ③ ④ ⑤ | | | |
|---------|------|-----------|---|----|--------|
| | | ① | ② | ③ | ④ |
| 2P | 8 8 | | | | |
| 3P | 8 8 | | | V3 | MPa |
| 4PL | 8 8 | | | V3 | MPa |
| 4PL | 8 8 | 0 | | 0 | 0 |
| 5PC | 8 8 | 0 | | 40 | V3/MPa |

*1) Refer to gauge guide (P.752) 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 | 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 | 1.5 times the maximum source pressure | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | |
| | Outlet | 3 times the maximum delivery pressure | | | |
| 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 **AK1200 Series**

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) | |

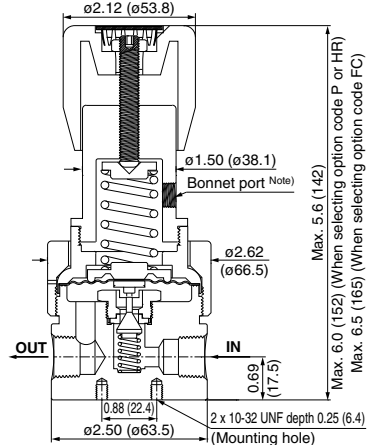
Wetted Parts Material

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

Dimensions

inch (mm)

AK1200



Note) The standard port is $\phi 1.5$. When selecting the option code P, HR, or FC, the connection is NPT 1/8 female thread.

AP

SL

AZ

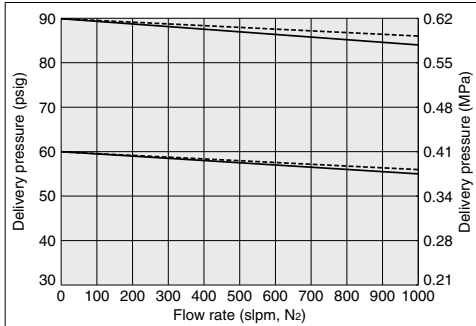
AK

BP

Flow Rate Characteristics

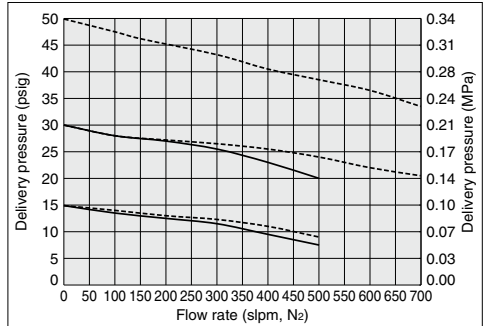
AK1200

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



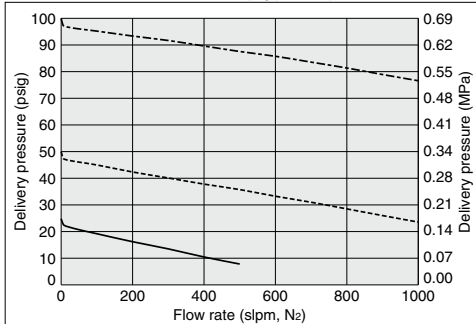
AK1200

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



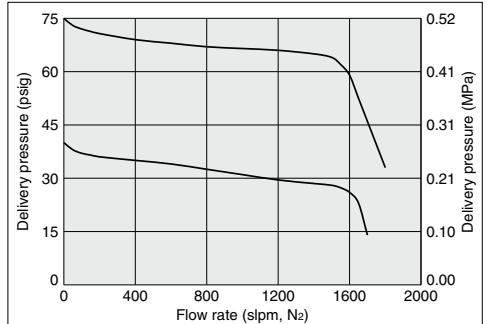
AK1200HF

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, Nz: 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)

AK9200 Series

- 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 1212 **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 |
|------|--------|--------|----------------|
| 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 |

Bonnet option

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

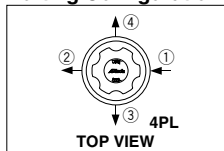
*3) Panel mounting hole: dia.39.6 mm.

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)

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 |

*1) Refer to gauge guide (P.752) 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.

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 | 1.5 times the maximum source pressure | | |
| | Outlet | 1.5 times the maximum delivery pressure | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | |
| | Outlet | 3 times the maximum delivery pressure | | |
| 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

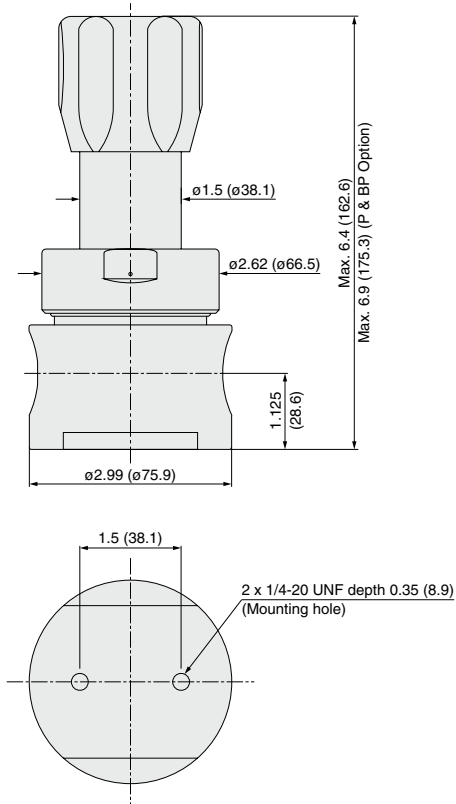
| Wetted Parts | S |
|--------------|----------------|
| Body | 316 SS |
| Nozzle | 316 SS |
| Poppet | 316 SS |
| Diaphragm | Ni-Cr-Mo alloy |
| Seat | PFA |

Single Stage Regulator for General Applications
High flow (Tied-diaphragm) **AK9200 Series**

Dimensions

inch (mm)

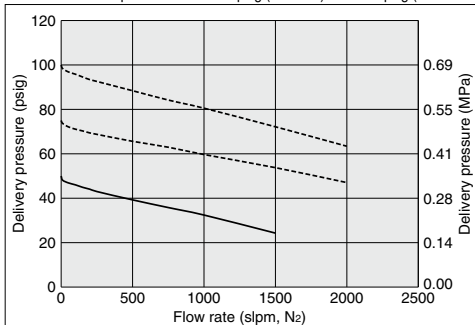
AK9200



- AP
- SL
- AZ
- AK**
- BP

Flow Rate 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.

Two Stage Regulator for General Applications

Low flow
(Tied-diaphragm)

AK1700 Series



- 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

How to Order

AK17 **02** **S** **5PC** **4** **4** **0** **0** **0** **0** **0** **0**

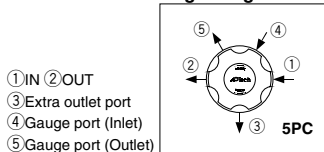
Delivery pressure

| 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) |
| 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 |

Porting configuration



Sample Order Number

| Port | ① | ② | ③ | ④ | ⑤ |
|---------|-----|---|---|---|-----------|
| AK1702S | 5PC | 4 | 4 | 0 | 0 |
| | 5PC | 4 | 4 | 0 | V3 40 MPa |

Port Number

① ② ③ ④ ⑤

Connections (Inlet ①, Outlet ②)

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

Gauge port (Extra outlet port 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.752) 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.

Bonnet option

| Code | Bonnet |
|---------|------------------------|
| No code | Standard |
| P | Panel installation *4) |

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

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.

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 | 1.5 times the maximum source pressure | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | |
| | Outlet | 3 times the maximum delivery pressure | | | |
| 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.

Two Stage Regulator for General Applications **AK1700 Series**

Low flow (Tied-diaphragm)

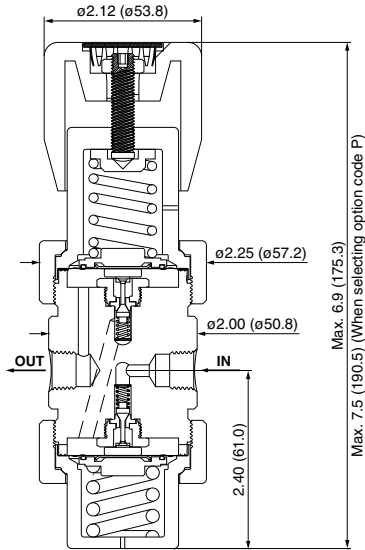
Wetted Parts Material

| Wetted Parts | B | S | SH |
|--------------|-------|---------------------------------|----------------------|
| Body | Brass | 316 SS | 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

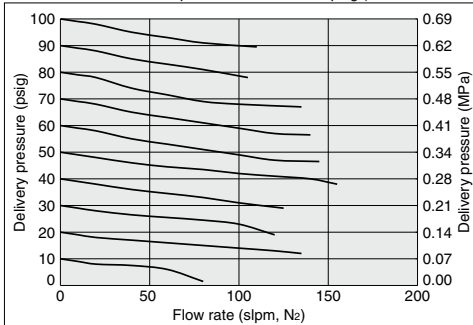


- AP
- SL
- AZ
- AK**
- BP

Flow Rate 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

BP1000 Series



- 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

How to Order

Port Number
BP10 01 S 4PL 4 4 0 0

Operating pressure

| Code | Operating 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) |

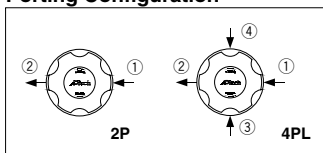
Material

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

Ports

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

Porting Configuration



① IN ② OUT ③ ④ 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} | |
|---------|--|-----------------|
| | psig/bar unit | MPa unit |
| 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 |

^{*1} Refer to gauge guide (P.752) 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.

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 | 1.5 times the maximum source pressure | | | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | | | |
| | Outlet | 3 times the maximum delivery pressure | | | | | |
| 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.

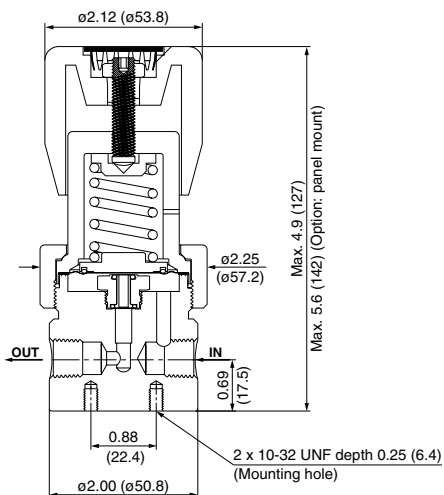
Back Pressure Regulator for General Applications **BP1000 Series**

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



AP

SL

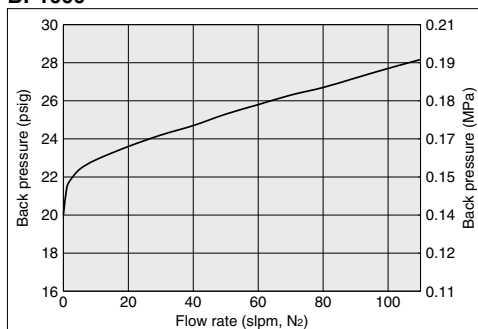
AZ

AK

BP

Flow Rate Characteristics

BP1000



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

Welded Connection Series Back Pressure Regulator for Ultra High Purity

BP1000 Series

- 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

Port Number
① ② ③

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) |

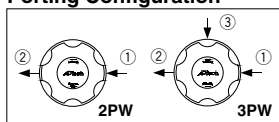
Material

| 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) |

Porting Configuration



① IN ② OUT ③ Gauge port (Inlet)

| 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 |

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 |

Gauge port (Inlet ③)

| Code | Pressure gauge *1) | |
|---------|---|-----------------|
| | psig/bar unit | MPa unit |
| No code | No pressure gauge | |
| 0 | No gauge port | |
| V3 | No pressure gauge (Connections: 1/4 inch face seal male) | |
| 0 | -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 |

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.

*1) Refer to gauge guide (P.752) 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 | |
| BP10 | 01 | S | 2PW FV4 FV4 |
| | | | 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 | 1.5 times the maximum source pressure | | | | |
| | Outlet | 1.5 times the maximum delivery pressure | | | | |
| Burst pressure | Inlet | 3 times the maximum source pressure | | | | |
| | Outlet | 3 times the maximum delivery pressure | | | | |
| 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 **BP1000 Series**

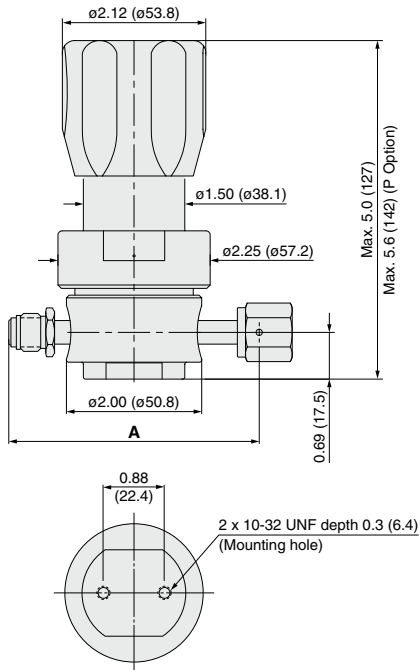
Wetted Parts Material

| 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)

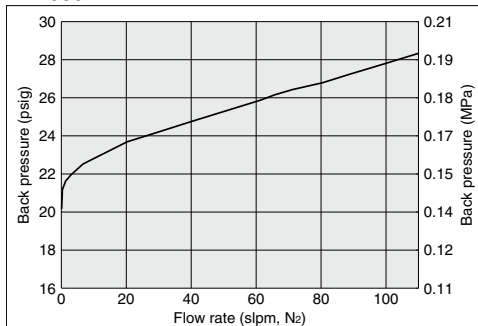
BP1000



| 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 Rate Characteristics

BP1000



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

AP

SL

AZ

AK

BP

AP10PA Series

- 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 | 316L SS | 316L SS | 316L SS |
| SHP | secondary remelt | | | |
| SH | remelt | 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 |
|---------|---|
| | 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 | 1.5 times the maximum source pressure |
| | Outlet | 1.5 times the maximum delivery pressure |
| Burst pressure | Inlet | 3 times the maximum source pressure |
| | Outlet | 3 times the maximum delivery pressure |
| 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. *3) Tested with Helium gas inlet pressure 1500 psig (10.5 MPa).

*2) Max. 90°C for Polyimide seat. *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.

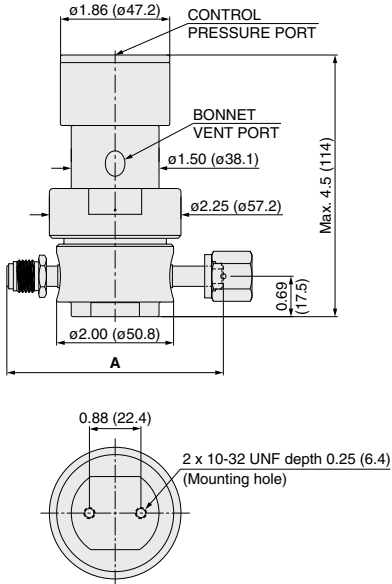
Wetted Parts Material

| 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

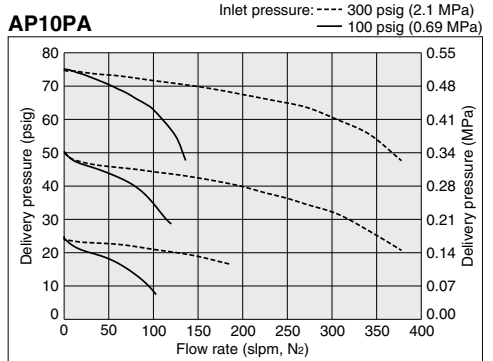
inch (mm)

AP10PA



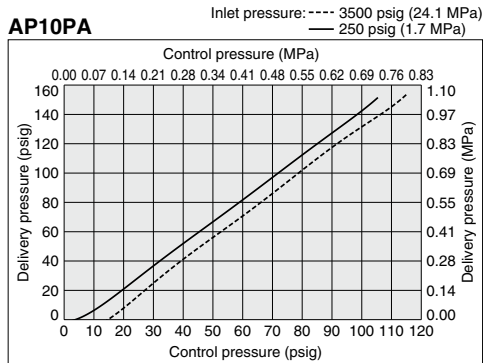
| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 3.70 | (94.0) |
| MV4 | 2.96 | (75.2) |
| FV6 | 4.70 | (119.4) |
| MV6 | 2.96 | (75.2) |

Flow Rate Characteristics



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

Input/Output Characteristics



AP
 SL
 AZ
 AK
 BP

Pneumatic Actuation Pressure Regulator

Low flow
(Tied-diaphragm)

AP15PA Series

- 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 | 316L SS | 316L SS | 316L SS |
| SHP | secondary remelt | | | |
| SH | remelt | 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 |
| 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 | 1.5 times the maximum source pressure |
| | Outlet | 1.5 times the maximum delivery pressure |
| Burst pressure | Inlet | 3 times the maximum source pressure |
| | Outlet | 3 times the maximum delivery pressure |
| 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 **AP15PA Series**

Low flow (Tied-diaphragm)

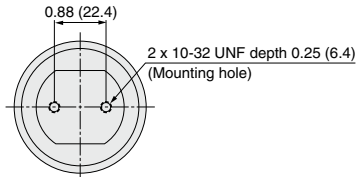
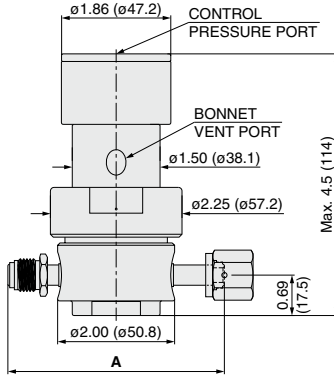
Wetted Parts Material

| 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 | PTFE (Option: Polyimide) | | PTFE | |

Dimensions

inch (mm)

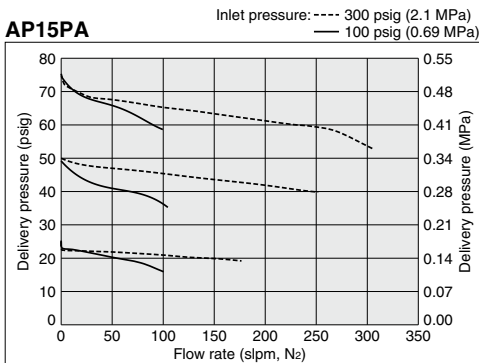
AP15PA



| 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) |

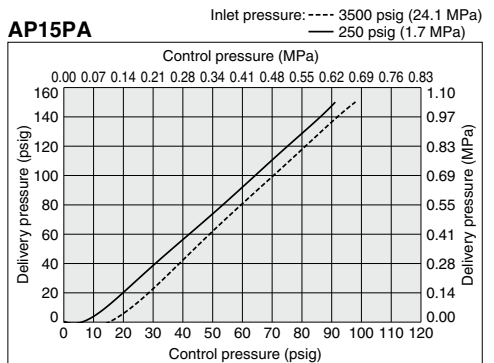
AP
SL
AZ
AK
BP

Flow Rate Characteristics



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

Input / Output Characteristics



AP14PAT Series



- 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

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 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 |

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 |
| 40 | 0 to 4000 psig | 0 to 28 MPa |

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 | 1.5 times the maximum source pressure | |
| | Outlet | 1.5 times the maximum delivery pressure | |
| Burst pressure | Inlet | 3 times the maximum source pressure | |
| | Outlet | 3 times the maximum delivery pressure | |
| 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) |

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

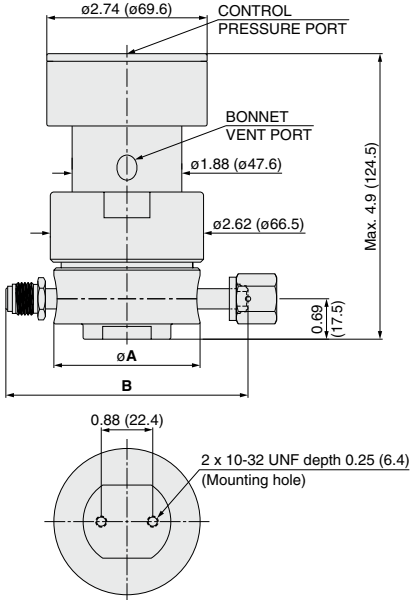
Wetted Parts Material

| 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

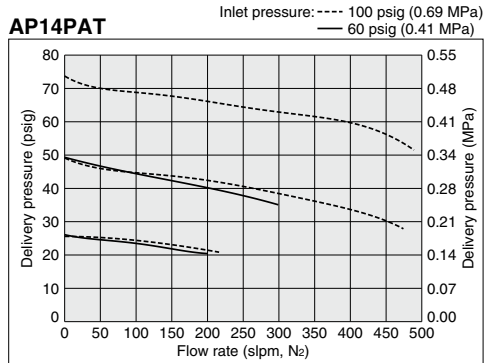
inch (mm)

AP14PAT



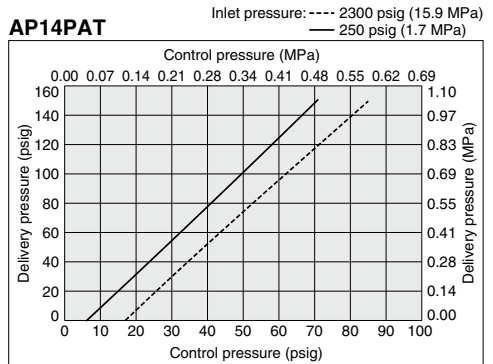
| Connections | A | | B | |
|-------------|------|--------|------|---------|
| | inch | (mm) | inch | (mm) |
| FV4 | 2.00 | (50.8) | 3.70 | (94.0) |
| MV4 | | | 4.00 | (101.6) |
| TW4 | | | 3.46 | (87.9) |
| FV6 | 2.50 | (63.5) | 5.22 | (132.6) |
| MV6 | | | 4.00 | (101.6) |
| TW6 | | | 4.00 | (101.6)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

Flow Rate Characteristics



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

Input / Output Characteristics



AP
SL
AZ
AK
BP

Pneumatic Actuation Pressure Regulator

High flow
(Tied-diaphragm)

AP12PA Series

- 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

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 | 316L SS | | 316L SS |
| SHP | 316L SS secondary remelt | Ni-Cr-Mo alloy | Ni-Cr-Mo alloy | |
| 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.

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.752) 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 | 1.5 times the maximum source pressure |
| | Outlet | 1.5 times the maximum delivery pressure |
| Burst pressure | Inlet | 3 times the maximum source pressure |
| | Outlet | 3 times the maximum delivery pressure |
| 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) |

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

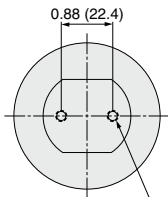
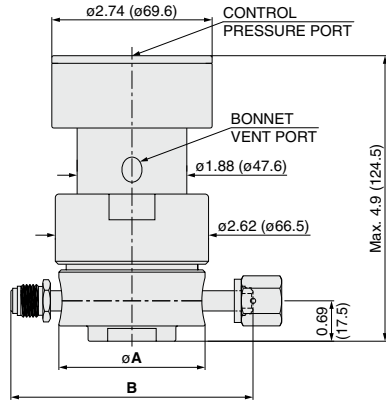
Wetted Parts Material

| 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



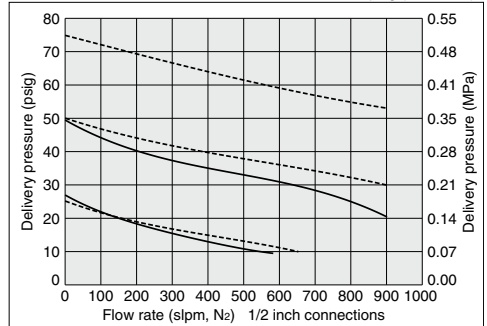
2 x 10-32 UNF depth 0.25 (6.4)
(Mounting hole)

| 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 | 2.50 | (63.5) | 4.00 | (101.6) |
| TW6 | | | 5.22 | (132.6) |
| FV8 | | | 4.34 | (110.2) |
| MV8 | | | 6.26 | (159.0) |
| TW8 | 2.50 | (63.5) | 5.00 | (127.0) |
| FV12 | | | 6.26 | (159.0) |
| TW12 | | | 5.00 | (127.0) |

Flow Rate Characteristics

AP12PA

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

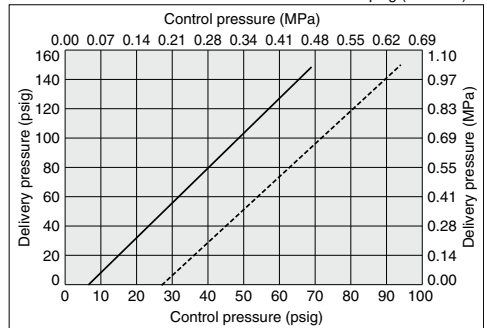


Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input / Output Characteristics

AP12PA

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



AP
SL
AZ
AK
BP

AZ10PA Series

- 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

AZ10PA 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 | 316L SS | Ni-Cr-Mo alloy | Ni-Cr-Mo alloy | 316L SS |

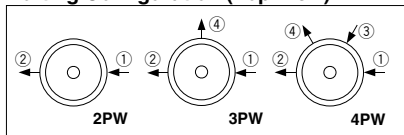
Surface finish

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

Ports

| Code | Ports |
|------|---------|
| 2PW | 2 ports |
| 3PW | 3 ports |
| 4PW | 4 ports |

Porting Configuration (Top View)



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) |
| 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 | psig/bar unit |
| No code | 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.752) 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: 0.09) |
| 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.

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 | | 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 | 1.5 times the maximum source pressure |
| | Outlet | 1.5 times the maximum delivery pressure |
| Burst pressure | Inlet | 3 times the maximum source pressure |
| | Outlet | 3 times the maximum delivery pressure |
| 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 μm. (0.25 μm) Option: 25 μm. (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.

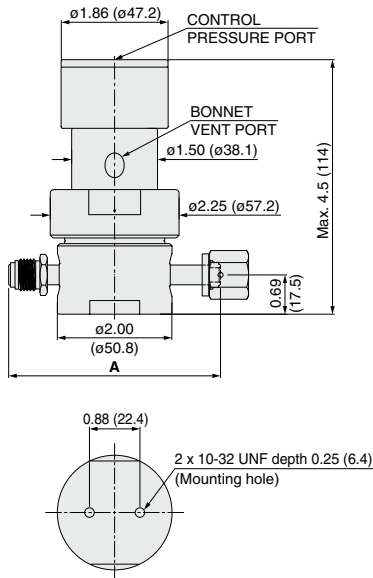
Wetted Parts Material

| 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 | PTFE (Option: Polyimide, PTFE) | PTFE (Option: PTFE) |

Dimensions

inch (mm)

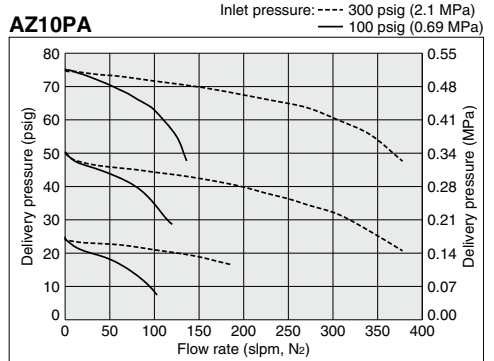
AZ10PA



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

Flow Rate Characteristics

AZ10PA



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

AP

SL

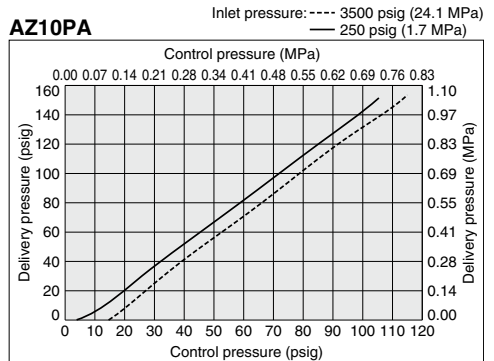
AZ

AK

BP

Input / Output Characteristics

AZ10PA



Pneumatic Actuation Pressure Regulator

Low flow
(Tied-diaphragm)

AZ15PA Series

- 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

Port Number

① ② ③ ④

AZ15PA 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 | 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) |

Seating material

| Code | Material |
|---------|-----------------|
| No code | PTFE (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.752). Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

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

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 | 1.5 times the maximum source pressure |
| | Outlet | 1.5 times the maximum delivery pressure |
| Burst pressure | Inlet | 3 times the maximum source pressure |
| | Outlet | 3 times the maximum delivery pressure |
| 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 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 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).

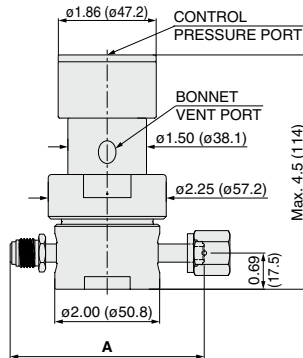
Wetted Parts Material

| 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

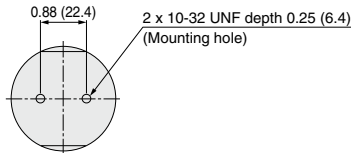
inch (mm)

AZ15PA

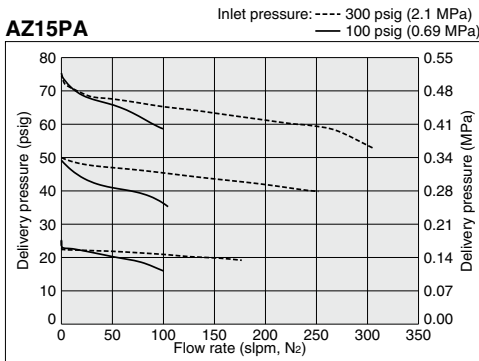


AP
SL
AZ
AK
BP

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

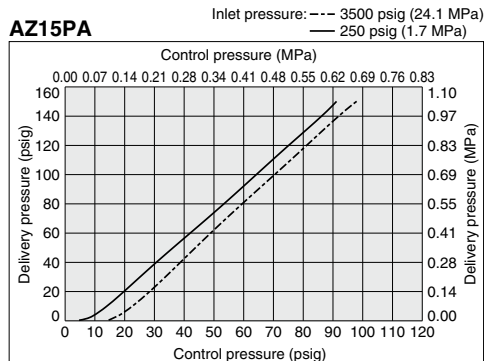


Flow Rate Characteristics



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

Input / Output Characteristics



Pneumatic Actuation Pressure Regulator

Intermediate flow
(Tied-diaphragm)

AZ14PAT Series



- 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



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) |

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 |
| 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 |
| 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.

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 | 1.5 times the maximum source pressure | |
| | Outlet | 1.5 times the maximum delivery pressure | |
| Burst pressure | Inlet | 3 times the maximum source pressure | |
| | Outlet | 3 times the maximum delivery pressure | |
| 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) |

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

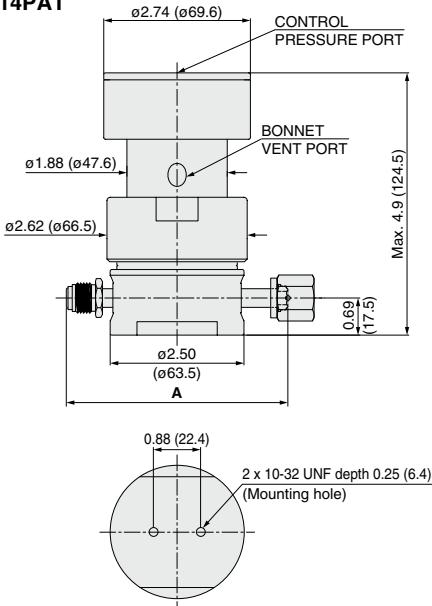
Wetted Parts Material

| 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

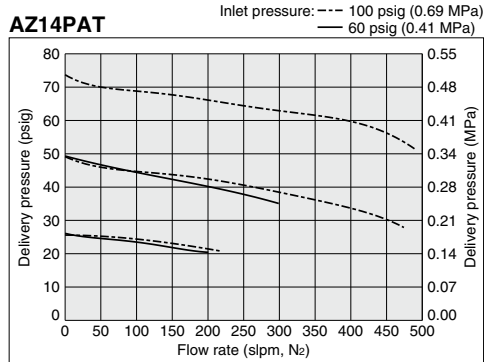
inch (mm)

AZ14PAT



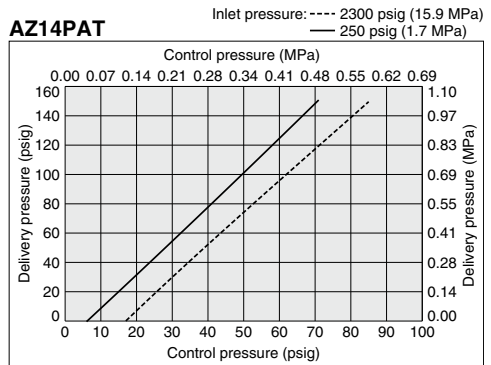
| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 4.30 | (109.2) |
| MV4 | | |
| FV6 | 5.22 | (132.6) |
| MV6 | | |
| TW6 | 4.00 | (101.6) |
| FV8 | 5.22 | (132.6) |
| MV8 | | |
| TW8 | 4.34 | (110.2) |

Flow Rate Characteristics



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

Input / Output Characteristics



AP
SL
AZ
AK
BP

Pneumatic Actuation Pressure Regulator

High flow (Tied-diaphragm)

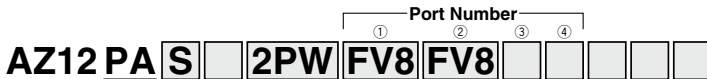
AZ12PA Series

- 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



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 | 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 |

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) |

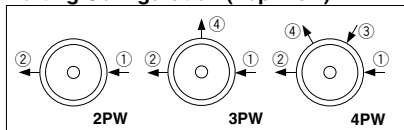
*3) Not available with SHP material.

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)

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) Refer to gauge guide (P.752) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

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 | 1.5 times the maximum source pressure |
| | Outlet | 1.5 times the maximum delivery pressure |
| Burst pressure | Inlet | 3 times the maximum source pressure |
| | Outlet | 3 times the maximum delivery pressure |
| 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) |

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

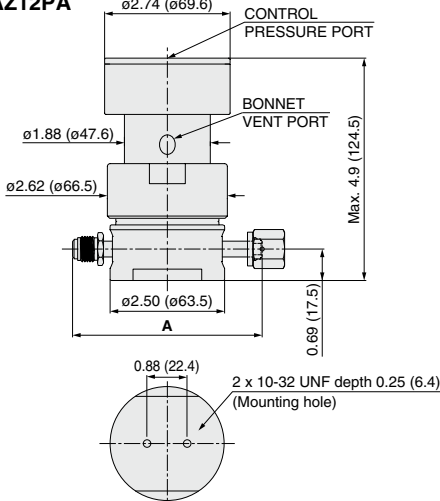
Wetted Parts Material

| 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

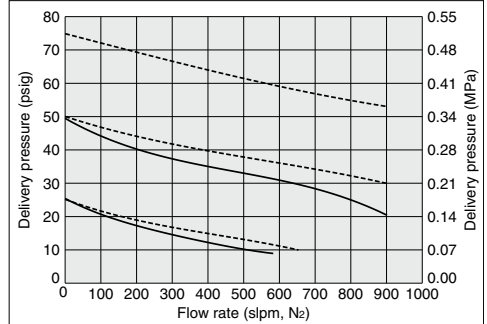


| Connections | A | |
|-------------|------|---------|
| | inch | (mm) |
| FV4 | 4.30 | (109.2) |
| MV4 | 4.30 | (109.2) |
| FV6 | 5.22 | (132.6) |
| MV6 | 5.22 | (132.6) |
| TW6 | 4.00 | (101.6) |
| FV8 | 5.22 | (132.6) |
| MV8 | 5.22 | (132.6) |
| TW8 | 4.34 | (110.2) |

Flow Rate Characteristics

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

AZ12PA

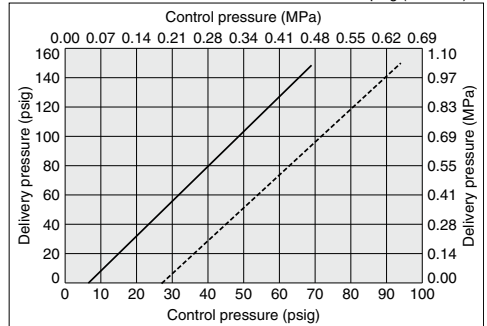


Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input / Output Characteristics

AZ12PA

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



AP
SL
AZ
AK
BP

AK10PA Series

- 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



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 (Inlet ①, Outlet ②)

| 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 | PTCFE (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 outlet port ③, Inlet ④, Outlet ⑤)

| Code | Pressure gauge unit *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.752) for gauge specifications. Select a pressure gauge, which has a larger pressure range than the delivery pressure range of the regulator.

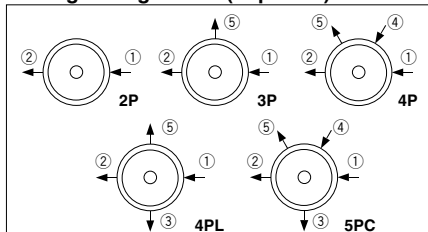
*2) 1/4 inch NPT plug is included only for port code 4PL and 5PC.

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 outlet port 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 | 1.5 times the maximum source pressure |
| | Outlet | 1.5 times the maximum delivery pressure |
| Burst pressure | Inlet | 3 times the maximum source pressure |
| | Outlet | 3 times the maximum delivery pressure |
| 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.

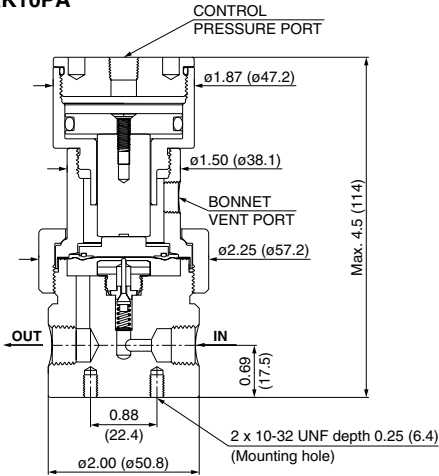
Wetted Parts Material

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

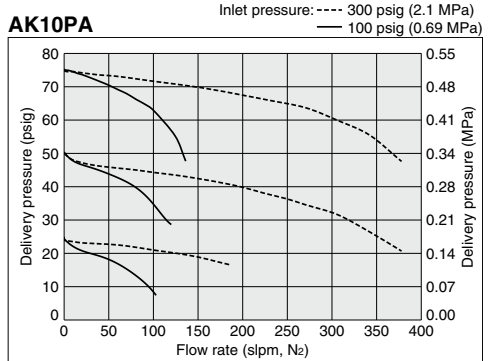
Dimensions

inch (mm)

AK10PA

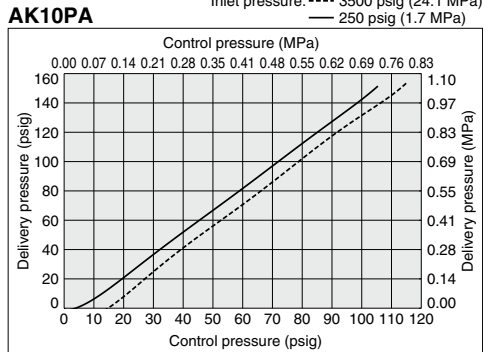


Flow Rate Characteristics



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

Input / Output Characteristics



AP
 SL
 AZ
AK
 BP

AK15PA Series



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

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 |

Connections
(Inlet ①, Outlet ②)

| | |
|------|----------------------|
| 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 | | | ● |
| 3P | Refer to the following porting configurations. | | ● |
| 4PL | | ● | ● |
| 5PC | | ● | ● |

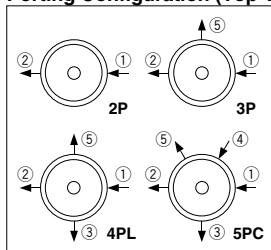
Gauge port

(Extra outlet port 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.752) 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.

Porting Configuration (Top View)



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

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 | 1.5 times the maximum source pressure |
| | Outlet | 1.5 times the maximum delivery pressure |
| Burst pressure | Inlet | 3 times the maximum source pressure |
| | Outlet | 3 times the maximum delivery pressure |
| Maximum control pressure | | 150 psig (1.0 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 |
| 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) |

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

Pneumatic Actuation Pressure Regulator **AK15PA Series**

Low flow (Tied-diaphragm)

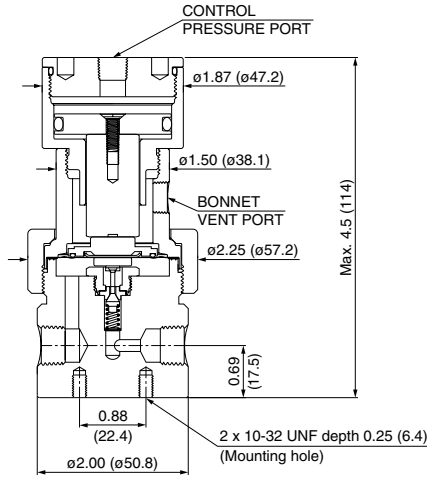
Wetted Parts Material

| Wetted Parts | B | S | SH |
|--------------|-------|---------------------------------|----------------------|
| Body | Brass | 316 SS | 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



AP

SL

AZ

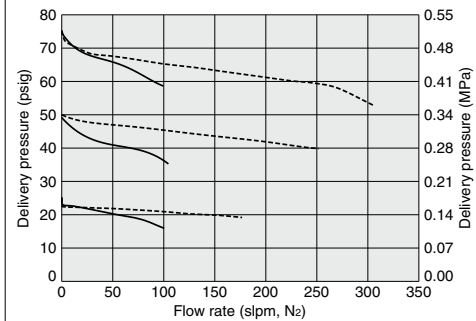
AK

BP

Flow Rate Characteristics

AK15PA

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

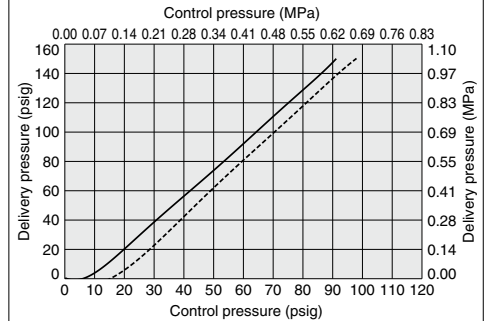


Note) slpm, N₂: The volumetric flow rate under normal conditions (0°C, 1 atm) when N₂ gas is flowing.

Input/Output Characteristics

AK15PA

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



Pneumatic Actuation Pressure Regulator

Intermediate flow
(Tied-diaphragm)

AK14PAT Series



RoHS

- 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 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 | Nozzle |
|------|--------|----------------|----------------|----------------|
| B | Brass | | | 316 SS |
| S | 316 SS | Ni-Cr-Mo alloy | Ni-Cr-Mo alloy | |
| SH | | | | Ni-Cr-Mo alloy |

Ports

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

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

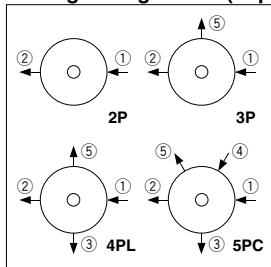
(Extra outlet port ③, Inlet ④, Outlet ⑤)

| 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.752) 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.

Porting Configuration (Top View)



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

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 |

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 | 1.5 times the maximum source pressure |
| | Outlet | 1.5 times the maximum delivery pressure |
| Burst pressure | Inlet | 3 times the maximum source pressure |
| | Outlet | 3 times the maximum delivery pressure |
| 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.

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) |

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

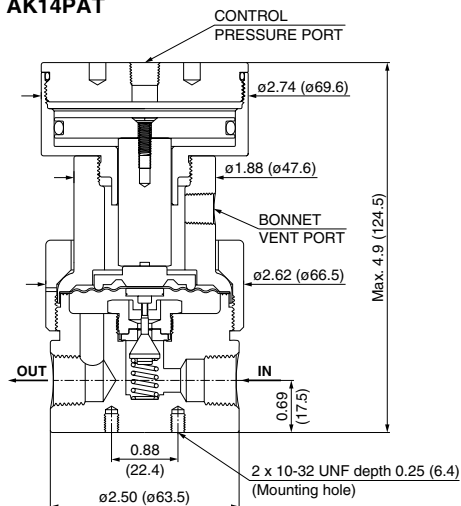
Wetted Parts Material

| 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 |

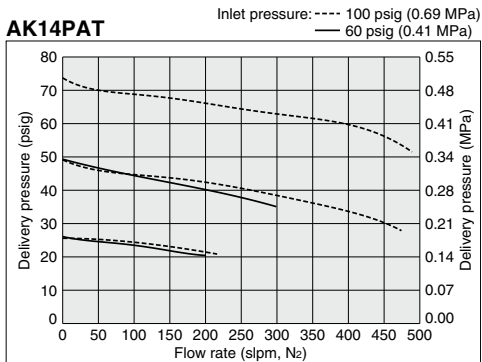
Dimensions

inch (mm)

AK14PAT

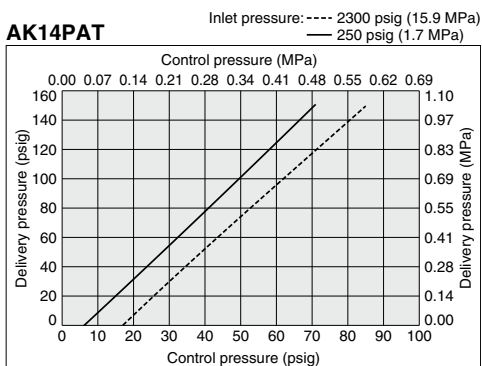


Flow Rate Characteristics



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

Input/Output Characteristics



AP

SL

AZ

AK

BP

Pneumatic Actuation Pressure Regulator

High flow (Tied-diaphragm)

AK12PA Series



- 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

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 | |
| 2P | Refer to the following porting configurations. | B | ● |
| 3P | | S | ● |
| 4PL | | SH | ● |
| 5PC | | B | ● |
| | | S | ● |

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 outlet port 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 |

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 |

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

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 | 1.5 times the maximum source pressure |
| | Outlet | 1.5 times the maximum delivery pressure |
| Burst pressure | Inlet | 3 times the maximum source pressure |
| | Outlet | 3 times the maximum delivery pressure |
| Maximum control pressure | | 150 psig (1.0 MPa) |
| Ambient and operating temperature | | -40 to 71°C (No freezing) *1) |
| 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) |

*1) 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) |

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

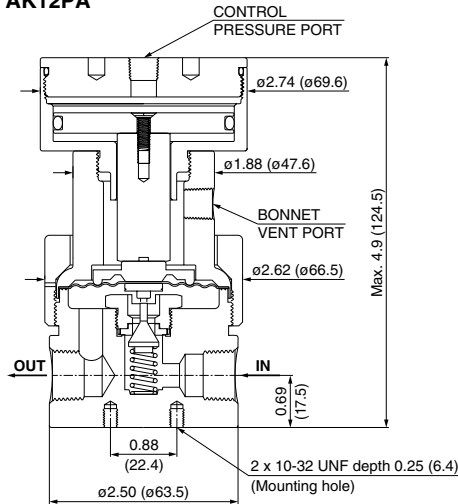
Wetted Parts Material

| 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

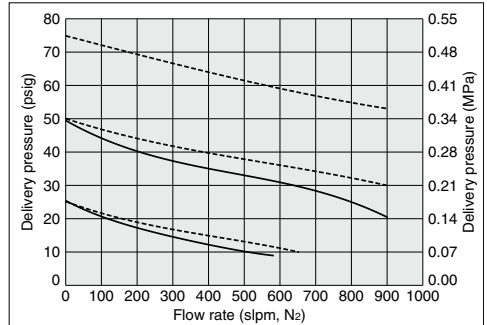
inch (mm)

AK12PA



Flow Rate Characteristics

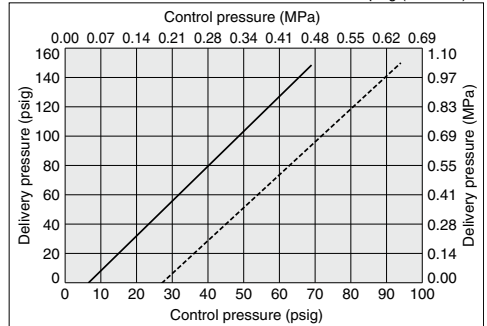
AK12PA Inlet pressure: ---- 100 psig (0.69 MPa) — 60 psig (0.41 MPa)
 1/2 inch connections



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

Input/Output Characteristics

AK12PA Inlet pressure: ---- 1700 psig (11.7 MPa) — 250 psig (1.7 MPa)



AP

SL

AZ

AK

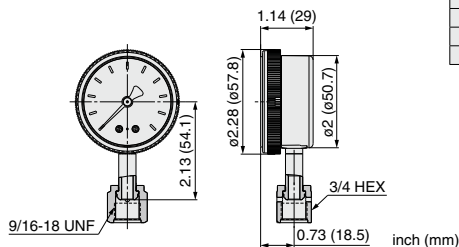
BP

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

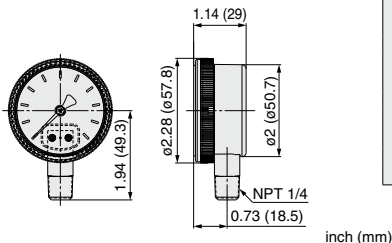
| Regulator Code ^{*2)} | | Pressure range | Unit | Part number ^{*3)} | | | |
|---|-----------------|-----------------------|-------------------------|----------------------------|-----------------|-----|------------|
| gauge port | unit | | | | | | |
| V3 L 1 H 2 4 10 40 | (No code) | -30 in.Hg to 30 psig | psig/bar ^{*4)} | 00-8300023 | | | |
| | | -30 in.Hg to 60 psig | | 00-8300026 | | | |
| | | -30 in.Hg to 100 psig | | 00-8300021 | | | |
| | | -30 in.Hg to 160 psig | | 00-8300116 | | | |
| | | 0 to 200 psig | | 00-8300020 | | | |
| | | 0 to 400 psig | | 00-8300007 | | | |
| | | 0 to 1000 psig | | 00-8300022 | | | |
| | | 0 to 4000 psig | | 00-8300024 | | | |
| | | V3 | | MPA | -0.1 to 0.2 MPa | MPa | 00-8300304 |
| | | L | | | -0.1 to 0.4 MPa | | 00-8300305 |
| 1 | -0.1 to 0.7 MPa | 00-8300300 | | | | | |
| H | -0.1 to 1.1 MPa | 00-8300297 | | | | | |
| 2 | 0 to 1.4 MPa | 00-8300299 | | | | | |
| 4 | 0 to 3 MPa | 00-8300301 | | | | | |
| 10 | 0 to 7 MPa | 00-8300302 | | | | | |
| 40 | 0 to 28 MPa | 00-8300303 | | | | | |

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 | (No code) | psig/bar ^{*4)} | 00-8300102 | |
| | V3 | | | -30 in.Hg to 30 psig | 00-8300184 |
| | L | | | -30 in.Hg to 60 psig | 00-8300181 |
| | 1 | | | -30 in.Hg to 100 psig | 00-8300182 |
| | H | | | -30 in.Hg to 160 psig | 00-8300196 |
| | V2 | | | -30 in.Hg to 200 psig | 00-8300033 |
| | 2 | | | 0 to 200 psig | 00-8300193 |
| | 4 | | | 0 to 400 psig | 00-8300194 |
| | 10 | | | 0 to 1000 psig | 00-8300187 |
| | 30 | | | 0 to 3000 psig | 00-8300234 |
| | 40 | 0 to 4000 psig | 00-8300183 | | |
| | V15 | MPA | MPa | 00-8300287 | |
| | V3 | | | -0.1 to 0.2 MPa | 00-8300288 |
| | L | | | -0.1 to 0.4 MPa | 00-8300289 |
| | 1 | | | -0.1 to 0.7 MPa | 00-8300290 |
| | H | | | -0.1 to 1.1 MPa | 00-8300291 |
| | V2 | | | -0.1 to 1.4 MPa | 00-8300292 |
| | 2 | | | 0 to 1.5 MPa | 00-8300286 |
| | 4 | | | 0 to 3 MPa | 00-8300285 |
| | 10 | | | 0 to 7 MPa | 00-8300284 |
| 30 | 0 to 21 MPa | | | 00-8300283 | |
| 40 | 0 to 28 MPa | 00-8300282 | | | |

^{*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)

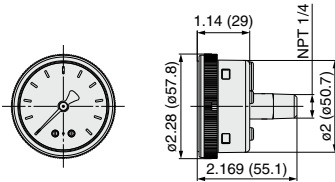
Stainless steel / Center back mount

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)

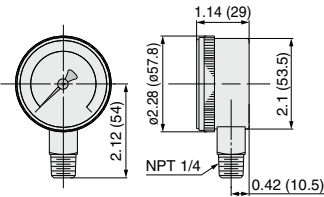
Brass / Lower mount

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 + Zn 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) | psig/bar *4) | 00-83000265 |
| | L | | | 00-83000177 |
| | 1 | | | 00-83000178 |
| | H | | | 00-83000239 |
| | 2 | | | 00-83000218 |
| | 4 | | | 00-83000205 |
| | 10 | 00-83000186 | | |
| | 40 | 00-83000179 | | |
| | V3 | MPA | MPa | 00-83000278 |
| | L | | | 00-83000279 |
| | 1 | | | 00-83000280 |
| | H | | | 00-83000281 |
| | 2 | | | 00-83000277 |
| | 4 | | | 00-83000276 |
| 10 | 00-83000275 | | | |
| 40 | 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 the products.

Refer to back page 50 for Safety Instructions and pages 633 and 634 for Process Gas Equipment Precautions.

Selection

Warning

1. Confirm the specifications.

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 the products.

Refer to back page 50 for Safety Instructions and pages 633 and 634 for Process Gas Equipment Precautions.

Selection

Warning

1. Confirm the specifications.

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.

AP

SL

AZ

AK

BP