

Regulators

For ultra high purity (UHP)

For UHP gas delivery in semiconductor and other clean industries.



AP9000



AP1600/AP1900



AP1400T

AP1700



AP2700



AP1200



AP1000/AP1100/AP1500

AP500

AP Series
P.666 to 687



SL5500



SL5400/SL5800

SL Series
P.688 to 695



SL5200



AZ1200/AZ1300/AZ1400T



AZ1000/AZ1100/AZ1500

AZ Series
P.696 to 709



AZ9200



BP1000 Welded

Back Pressure Regulator

BP Series
P.726, 727

Regulators

For ultra high purity (UHP)

For UHP gas delivery in semiconductor and other clean industries.

<Air operated type>



AP10PA/AP15PA



AP12PA/AP14PAT

AP□PA Series

P.728 to 735



AZ10PA/AZ15PA



AZ12PA/AZ14PAT

AZ□PA Series

P.736 to 743

For general applications

For wide variety of applications from semiconductor to general.



AK1700



AK1000/AK1500



AK1200/
AK1300/
AK1400T



AK9200

AK Series

P.710 to 723



BP1000

Back Pressure Regulator

BP Series

P.724, 725

<Air operated type>



AK10PA/AK15PA



AK12PA/AK14PAT

AK□PA Series

P.744 to 751

AP
SL
AZ
AK
BP

Diaphragm Valves

For ultra high purity (UHP)

For UHP gas delivery in semiconductor and other clean industries.

AP3700

AP3000/AP3200

AP3130

AP3550/AP4550

AP3540/AP4540

AP3571/AP4571

Air operated type
AP Series
 P.758 to 771

AP3100

AP3800

AP3900

AP3600/AP4600/AP3260

AP3150

AP3650/AP4650

AP3657/AP4657

AP3125

AP3625/AP4625

Manually operated type
AP Series
 P.772 to 781

Check Valve

AP64

AP64 Series
 P.786, 787

Vacuum Generators

AP72

AP70

AP71

AP7

AP7,70/71/72 Series
 P.788 to 793

Flow Switches

AP74B

AP74

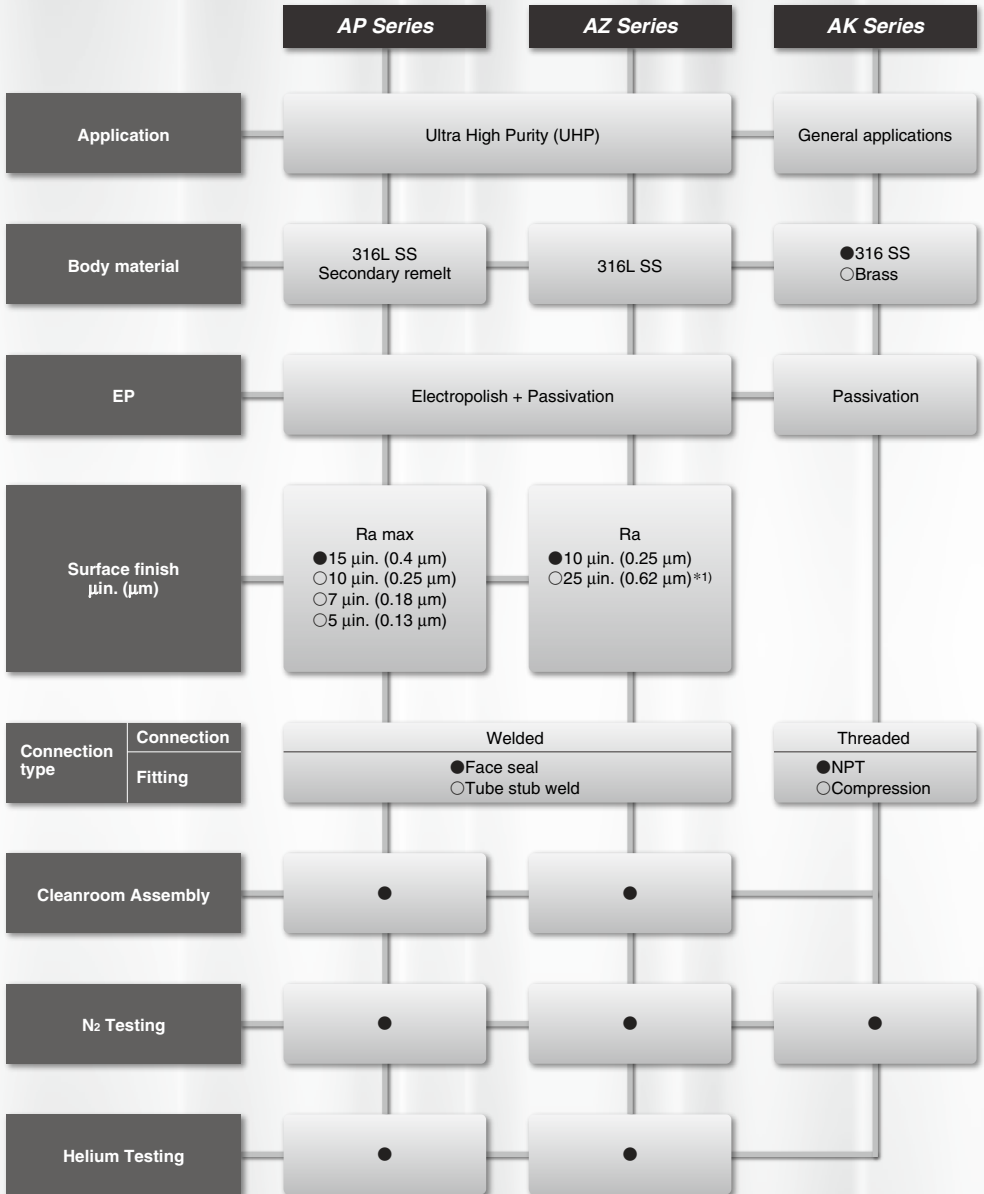
AP74/74B Series
 P.794 to 797

● Technical Data/Glossary of Terms P.826, 827

Series Features

● Standard
















○ Selectable by model or option



AP
SL
AZ
AK
BP

*1) Optional finish not available on all AZ series.

Regulator AP/SL Series

Series			Application		Construction		Material		Max. inlet pressure	
			Distribution (Point of use)	Source (Cylinder)	Tied diaphragm	Springless	Body *1)	Ni-Cr-Mo alloy Internal	psig	(MPa)
Single stage	AP1000		●	△			316L VAR	○	300	2.1
									3500	24.1
	AP1100		●	●*4)			316L VAR	○	300	2.1
	AP1500		●	●	●		316L VAR	○	3500	24.1
	SL5500		●	●	●	●	316L VAR	○	3500	24.1
	AP1600		●				316L VAR	○	100	0.7
									3500	24.1
	AP1900		●	●	●		316L VAR	○	3500	24.1
	SL5400		●	●	●	●	316L VAR	○	1000	6.9
	SL5800		●	●	●	●	316L VAR	○	300	2.1
	AP1400T		●	●	●		316L VAR	●	300	2.1
									2300	15.9
									●2300 ○3000	●15.9 ○20.7
AP1200		●	●	●		316L VAR	○	1700	11.7	
								●1700 ○3000	●11.7 ○20.7	
AP9000		●	●	●		316L	●	1700	11.7	
AP9100						316L	●	800	5.5	
AP9115		●	●	●				250	1.7	
Single stage (compact)	AP500		●				316L VAR	○	150	1.0
	SL5200		●		●	●	316L VAR	○	150	1.0
Two stage	AP1700			●	●		316L VAR	○	3500	24.1
	AP2700			●	●		316L VAR	○	3500	24.1

*1) 316L VAR : 316L SS secondary remelt 316L : 316L SS

*2) In accordance with SEMI F32.

*3) At 150 psig (1.0 MPa) inlet pressure. Figure varies depending on gas and operating pressures.








*4) For low vapor pressure gases.

●Standard ○Selectable by model or option
 △May be selected for source applications of inert gases, though tied diaphragm is recommended.








Outlet pressure		Sub-atmospheric (Absolute)	Cv *2)	Flow, N ₂ *3) slpm	Connection size inch	Connection type		Page
psig	(MPa)					Connection	Fittings	
1 to 10 1 to 30 2 to 60 2 to 100 5 to 150	0.007 to 0.07 0.007 to 0.2 0.014 to 0.4 0.014 to 0.7 0.034 to 1.0		●0.09 ○0.15	●30 ○120 (HF opt.)	1/4 3/8	Welded	●Face seal ○Tube stub	P.668
100 mmHg absolute to 10 psig	-88 kPa to 0.07 MPa	●	0.05	0.5	1/4 3/8			
1 to 30 2 to 60 2 to 100 5 to 150	0.007 to 0.2 0.014 to 0.4 0.014 to 0.7 0.034 to 1.0		0.09	30	1/4 3/8			P.670
100 mmHg abs. to 30 psig	-88 kPa to 0.2 MPa	○	0.09	30	1/4 3/8			P.690
1 to 10 1 to 30 2 to 60 2 to 100	0.007 to 0.07 0.007 to 0.2 0.014 to 0.4 0.014 to 0.7		0.13	100	1/4 3/8			P.672
1 to 10 1 to 30 2 to 60 2 to 100 5 to 150	0.007 to 0.07 0.007 to 0.2 0.014 to 0.4 0.014 to 0.7 0.034 to 1.0		●0.13 ○0.16	●100 ○150 (HF opt.)	1/4 3/8 1/2			P.674
1 to 30 1 to 60 2 to 100	0.007 to 0.2 0.007 to 0.4 0.014 to 0.7		0.23	120	1/4 3/8 1/2			P.692
1 to 30 1 to 60 2 to 100	0.007 to 0.2 0.007 to 0.4 0.014 to 0.7		0.4	200	1/4 3/8 1/2			P.694
100 mmHg abs. to 30 psig	-88 kPa to 0.2 MPa	○	0.45	400	1/4 3/8 1/2			P.676
1 to 30 2 to 60 2 to 100 5 to 150	0.007 to 0.2 0.014 to 0.4 0.014 to 0.7 0.034 to 1.0		●0.65 ○1.1	●800 ○1000 (HF opt.) ○1500 (FC opt.)	1/4 3/8 1/2 3/4			P.678
5 to 100 Preset to 300	0.034 to 0.7 Preset to 2.1		3.0	2000	1/2 3/4 1			P.686
5 to 100	0.034 to 0.7		4.0	5000	1/2 3/4 1			
5 to 150	0.034 to 1.0							
100 mmHg abs. to 10 psig	-88 kPa to 0.07 MPa	○	●0.06 ○0.1	●15 ○30 (HF opt.)	1/4			Welded
100 mmHg abs. to 10 psig	-88 kPa to 0.07 MPa	○	●0.07 ○0.15	●30 ○130 (HF opt.)	1/4 3/8	P.688		
1 to 30 2 to 60 2 to 100	0.007 to 0.2 0.014 to 0.4 0.014 to 0.7		0.05	30	1/4 3/8	Welded	●Face seal ○Tube stub	P.682
1 to 30 2 to 60 2 to 100 3 to 120	0.007 to 0.2 0.014 to 0.4 0.014 to 0.7 0.021 to 0.8		0.105	150	1/4 3/8			P.684

AP
 SL
 AZ
 AK
 BP

Regulator AZ Series

Series			Application		Construction		Material		Max. inlet pressure		
			Distribution (Point of use)	Source (Cylinder)	Tied diaphragm	Springless	Body *1)	Ni-Cr-Mo alloy Internal	psig	(MPa)	
Single stage	AZ1000		●	△			316L	○	300	2.1	
								○	3500	24.1	
	AZ1100		●	●*4)				○	300	2.1	
	AZ1500		●	●	●			○	3500	24.1	
	AZ1400T		●	●	●			●	○	300	2.1
									○	2300	15.9
									○	2300	15.9
				○	3000	20.7					
AZ1300		●					○	300	2.1		
AZ1200		●	●	●		○	○	1700	11.7		
							○	●1700	●11.7		
								○3000	○20.7		
AZ9200		●		●				○	300	2.1	

Regulator AK Series

Series			Application		Construction		Material		Max. inlet pressure		
			Distribution (Point of use)	Source (Cylinder)	Tied diaphragm	Springless	Body *1)	Ni-Cr-Mo alloy Internal	psig	(MPa)	
Single stage	AK1000		●	△			●316 ○B	○	300	2.1	
								○	3500	24.1	
	AZ1500		●	●	●			○	3500	24.1	
	AK1400T		●	●	●			●	○	300	2.1
									○	2300	15.9
									○	2300	15.9
				○	3000	20.7					
	AZ1300		●						○	300	2.1
AZ1200		●	●	●		○	○	1700	11.7		
							○	●1700	●11.7		
								○3000	○20.7		
AZ9200		●		●				○	300	2.1	
Two stage	AK1700		●	●			○	3500	24.1		

*1) 316L : 316L SS 316 : 316 SS B : Brass

*2) In accordance with SEMI F32.

*3) At 150 psig (1.0 MPa) inlet pressure. Figure varies depending on gas and operating pressures.

*4) For low vapor pressure gases.

●Standard ○Selectable by model or option

△May be selected for source applications of inert gases, though tied diaphragm is recommended.

Outlet pressure			Cv *2)	Flow, N ₂ *3)	Connection size inch	Connection type		Page		
psig	(MPa)	Sub-atmospheric (Absolute)				Connection	Fittings			
1 to 10	0.007 to 0.07	●	●0.09 ○0.15	●30 ○120 (HF opt.)	1/4 3/8	Welded	●Face seal ○Tube stub	P.696		
1 to 30	0.007 to 0.2									
2 to 60	0.014 to 0.4									
2 to 100	0.014 to 0.7									
5 to 150	0.034 to 1.0									
100 mmHg absolute to 10 psig	-88 kPa to 0.07 MPa	0.05	0.5	1/4 3/8	P.708					
1 to 30	0.007 to 0.2	○	0.09	30	1/4 3/8			Welded	●Face seal ○Tube stub	P.698
2 to 60	0.014 to 0.4									
2 to 100	0.014 to 0.7									
5 to 150	0.034 to 1.0									
100 mmHg abs. to 30 psig	-88 kPa to 0.2 MPa									
1 to 30	0.007 to 0.2	0.45	400	1/4 3/8	P.700					
2 to 60	0.014 to 0.4									
2 to 100	0.014 to 0.7	1.1	1000	1/4 3/8 1/2	P.702					
5 to 150	0.034 to 1.0									
1 to 30	0.007 to 0.2					●0.65 ○1.1	●800 ○1000 (HF opt.) ○1500 (FC opt.)			1/4 3/8
2 to 60	0.014 to 0.4									
2 to 100	0.014 to 0.7					1.6	2000	3/4 1	P.706	
5 to 150	0.034 to 1.0									
1 to 30	0.007 to 0.2									
2 to 60	0.014 to 0.4									
2 to 100	0.014 to 0.7									
5 to 150	0.034 to 1.0									

AP

SL













AZ

AK

BP

Outlet pressure			Cv *2)	Flow, N ₂ *3)	Connection size inch	Connection type		Page		
psig	(MPa)	Sub-atmospheric (Absolute)				Connection	Fittings			
0.5 to 10	0.007 to 0.07	●	●0.09 ○0.15	●30 ○120 (HF opt.)	1/4 3/8	Threaded	●NPT ○Compression	P.710		
1 to 30	0.007 to 0.2									
2 to 60	0.014 to 0.4									
2 to 100	0.014 to 0.7									
5 to 150	0.034 to 1.0									
1 to 30	0.007 to 0.2	○	0.09	30	1/4 3/8			Threaded	●NPT ○Compression	P.712
2 to 60	0.014 to 0.4									
2 to 100	0.014 to 0.7									
5 to 150	0.034 to 1.0									
100 mmHg abs. to 30 psig	-88 kPa to 0.2 MPa									
1 to 30	0.007 to 0.2	0.45	400	1/4 3/8	P.714					
2 to 60	0.014 to 0.4									
2 to 100	0.014 to 0.7	1.1	1000	1/4 3/8 1/2	P.716					
5 to 150	0.034 to 1.0									
1 to 30	0.007 to 0.2					●0.65 ○1.1	●800 ○1000 (HF opt.) ○1500 (FC opt.)			1/4 3/8
2 to 60	0.014 to 0.4									
2 to 100	0.014 to 0.7					1.6	2000	3/4	P.720	
5 to 150	0.034 to 1.0									
1 to 30	0.007 to 0.2									
2 to 60	0.014 to 0.4									
2 to 100	0.014 to 0.7									
5 to 150	0.034 to 1.0									
1 to 30	0.007 to 0.2	○	0.05	30	1/4 3/8	Threaded	●NPT ○Compression	P.722		
2 to 60	0.014 to 0.4									
2 to 100	0.014 to 0.7									
5 to 150	0.034 to 1.0									
1 to 30	0.007 to 0.2									

Air Operated Regulator AP/AZ/AK Series

Series		Application		Construction		Material		Max. inlet pressure		
		Distribution (Point of use)	Source (Cylinder)	Tied diaphragm	Springless	Body *1)	Ni-Cr-Mo alloy Internal	psig	(MPa)	
Single stage	AP10PA		●	△			316L VAR	○	3500	24.1
	AP15PA			●	●			○	3500	24.1
	AP14PAT		●	●	●			●	●2300 ○3000	●15.9 ○20.7
	AP12PA		●	●	●			○	●1700 ○3000	●11.7 ○20.7
	AZ10PA		●	△			316L	○	3500	24.1
	AZ15PA			●	●			○	3500	24.1
	AZ14PAT		●	●	●			●	●2300 ○3000	●15.9 ○20.7
	AZ12PA		●	●	●			○	●1700 ○3000	●11.7 ○20.7
	AK10PA		●	△			●316 ○B	○	3500	24.1
	AK15PA			●	●			○	3500	24.1
	AK14PAT		●	●	●			●	●2300 ○3000	●15.9 ○20.7
	AK12PA		●	●	●			○	●1700 ○3000	●11.7 ○20.7

*1) 316L VAR : 316L SS secondary remelt 316L : 316L SS

*2) In accordance with SEMI F32.

*3) At 150 psig (1.0 MPa) inlet pressure. Figure varies depending on gas and operating pressures.

●Standard ○Selectable by model or option


△May be selected for source applications of inert gases, though tied diaphragm is recommended.

	Outlet pressure			Cv *2)	Flow, N ₂ *3)	Connection size inch	Connection type		Page
	psig	(MPa)	Sub-atmospheric (Absolute)				Connection	Fittings	
	7 to 150	0.05 to 1.0		●0.09 ○0.15	●30 ○120 (HF opt.)	1/4 3/8	Welded	●Face seal ○Tube stub	P.728
	7 to 150	0.05 to 1.0		0.09	30	1/4 3/8			P.730
	7 to 150	0.05 to 1.0		0.45	400	1/4 3/8 1/2			P.732
	7 to 150	0.05 to 1.0		●0.65 ○1.1	●800 ○1000 (HF opt.)	1/4 3/8 1/2 3/4			P.734
	7 to 150	0.05 to 1.0		●0.09 ○0.15	●30 ○120 (HF opt.)	1/4 3/8	Welded	●Face seal ○Tube stub	P.736
	7 to 150	0.05 to 1.0		0.09	30	1/4 3/8			P.738
	7 to 150	0.05 to 1.0		0.45	400	1/4 3/8 1/2			P.740
	7 to 150	0.05 to 1.0		●0.65 ○1.1	●800 ○1000 (HF opt.)	1/4 3/8 1/2			P.742
	7 to 150	0.05 to 1.0		●0.09 ○0.15	●30 ○120 (HF opt.)	1/4 3/8	Threaded	●NPT ○Compression	P.744
	7 to 150	0.05 to 1.0		0.09	30	1/4 3/8			P.746
	7 to 150	0.05 to 1.0		0.45	400	1/4 3/8 1/2			P.748
	7 to 150	0.05 to 1.0		●0.65 ○1.1	●800 ○1000 (HF opt.)	1/4 3/8 1/2			P.750

AP
SL
AZ
AK
BP

Back Pressure Regulator *BP Series*

●Standard ○Selectable by model or option

Series	Body material ^{*1)}	Operating pressure		Cv ^{*2)}	Connection size inch	Connection type		Page
		psig	(MPa)			Connection	Fittings	
BP1000	 316L VAR	0.5 to 10 1 to 30 2 to 60 5 to 100 15 to 200 15 to 300	0.0034 to 0.07 0.007 to 0.2 0.014 to 0.4 0.034 to 0.7 0.1 to 1.4 0.1 to 2.1	0.3	1/4 3/8	Welded	●Face seal ○Tube stub	P.726
	●316 ○B						○Compression	

*1) 316L VAR : 316L SS secondary remelt 316L : 316L SS 316 : 316 SS S : 300 SS series B : Brass






*2) In accordance with SEMI F32.

Pressure Gauges (For UHP and general applications) ▶▶▶ P.752




- AP
- SL
- AZ
- AK
- BP

Diaphragm Valves (Air operated)

Series		Application		Status		Body material *1)
		Distribution (Point of use)	Source (Cylinder)	N.C.	N.O.	
Air operated	AP3540		●		●	316L VAR
	AP3550		●	△	●	
	AP3580		●		●	
	AP3000			●	●	
	AP4540		●		●	
	AP4550		●	△	●	
	AP4580		●		●	
	AP3113		●	●	●	
	AP3130		●	●	●	
	AP3700		●	△	●	
	AP3708		●		●	

Diaphragm Valves (Two step mode)

Series		Application		Status		Body material *1)
		Distribution (Point of use)	Source (Cylinder)	N.C.	N.O.	
Air operated Two step mode	AP3571		●		●	316L VAR
	AP4571		●		●	

*1) 316L VAR : 316L SS secondary remelt

*2) In accordance with SEMI F32.


●Standard ○Selectable by model or option
 △Source applications for maximum source pressure of 250 psig (1.7 MPa) or less.

Max. operating pressure		Cv *2)	LOTO	Connection size inch	Connection type		Page
psig	(MPa)				Connection	Fitting	
125	1.0	0.29	○	1/4 3/8	Welded	●Face seal ○Tube stub	P.758
250	2.1	0.29					
250	1.7	0.29	○				
3000	20.7	●0.23 ○0.28	○	1/4 3/8			P.762
125	0.9	0.5	○	1/4 3/8			P.760
250	2.1	0.5					
250	1.7	0.5	○				
1300	9.0	1.0	○	1/4 3/8 1/2 3/4			P.764
3000	20.7	0.7	○				
250	1.7	2.8		3/8 1/2 3/4			P.766
250	1.7	2.8					


AP
 SL
 AZ
 AK
 BP

Max. operating pressure		Cv *2)	LOTO	Connection size inch	Connection type		Page
psig	(MPa)				Connection	Fitting	
125	0.9	0.29		1/4 3/8	Welded	●Face seal ○Tube weld	P.768
125	0.9	0.5					

Diaphragm Valves (Manual)

Series		Application		Knob	Body material *1)	
		Distribution (Point of use)	Source (Cylinder)			
Manual	AP3600		●	●	Multi turn round knob	316L VAR
	AP3625		●	●	1/4 turn lever knob	
	AP3650		●	●	1/4 turn indicating round knob	
	AP3657		●	●	Pull twist round knob	
	AP4600		●	△	Multi turn round knob	
	AP4625		●	△	1/4 turn lever knob	
	AP4650		●	△	1/4 turn indicating round knob	
	AP4657		●	△	Pull twist round knob	
	AP3100		●	●	Multi turn round knob	
	AP3125		●	●	1/4 turn lever knob	
	AP3150		●	●	1/4 turn indicating round knob	
	AP3157		●	●	Pull twist round knob	
	AP3800		●	△	Round knob	
	AP3900		●	△	Pull twist round knob	

Diaphragm Valves (Metal seated)

Series		Application		Status or Knob	Body material *1)	
		Distribution (Point of use)	Source (Cylinder)			
Air operated	AP3200		●		N.C.	316L VAR
Manual	AP3260		●		Multi turn round knob	

*1) 316L VAR : 316L SS secondary remelt

*2) In accordance with SEMI F32.

Option (LOTO, Operational Safety Device) ▶▶▶ P.782 Porting Guide ▶▶▶ P.783

●Standard ○Selectable by model or option
 △Source applications for maximum source pressure of 250 psig (1.7 MPa) or less.


Max. operating pressure		Cv *2)	LOTO	Connection size inch	Connection type		Page						
psig	(MPa)				Connection	Fitting							
3000	20.7	0.29	○	1/4 3/8	Welded	●Face seal ○Tube stub	P.772						
			●										
250	2.1	0.5	○	1/4 3/8			Welded	●Face seal ○Tube stub	P.774				
			●										
3000	20.7	●0.7 ○1.3		1/4 3/8 1/2 3/4					Welded	●Face seal ○Tube stub	P.776		
3000	20.7	1.0	○										
1300	9.0	1.0											
1300	9.0	1.0	●								Welded	●Face seal ○Tube stub	P.776
250	1.7	2.8		3/8 1/2 3/4									
			●										

- AP
- SL
- AZ
- AK
- BP


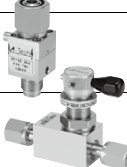
Maximum inlet pressure		Cv *2)	LOTO	Connection size inch	Connections		Page
psig	MPa				Connection	Fitting	
125	0.9	0.27		1/4 3/8	Welded	●Face seal ○Tube weld	P.770
125	0.9	0.27					P.780

Check Valve


● Standard ○ Selectable by model or option

Series	Body material *1)	Max. operating pressure		Cracking pressure		Cv *2)	Connection size inch	Connection type		Page	
		psig	(MPa)	psid	(MPa)			Connection	Fitting		
AP64		316L VAR	3500	24.1	3	0.023	0.4 max	1/4	Welded	● Face seal ○ Tube stub	P.786

Vacuum Generator

Series	Body material *1)	Max. vacuum pressure		Modules *3)	Check valve cracking pressure		Constant bleed	Connection size inch	Connection type		Page	
		in.Hg (Torr)	(kPa)		psid	(MPa)			Connection	Fitting		
AP7		316L	-26 (100)	-88	—	—		1/4 3/8	Welded	● Face seal ○ Tube stub	P.788	
AP70		316L	-26 (100)	-88	—	—		1/4 3/8				
AP71		316L	-26 (100)	-88	●	3	0.023	○			1/4 3/8	P.790
AP72		316L VAR	-26 (100)	-88	●	3	0.023	○			1/4 3/8	P.792

Flow Switch

Series	Body material *1)	Max. operating pressure		Flow, at 100 psig (0.69 MPa) N ₂ slpm	Connection size inch	Connections		Page	
		psig	MPa			Connection	Fitting		
AP74		316L VAR	3500	24.1	2 5 10 25 50 100	1/4	Welded	● Face seal ○ Tube stub	P.794
AP74B									
	2400	16.3	1100 1650 2600	3/4	P.796				

*1) 316L VAR : 316L SS secondary remelt 316L : 316L SS

*2) In accordance with SEMI F32.

*3) Monoblock vacuum generator, N₂ supply valve and check valve

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