Process Gas Diaphragm Valve

Series AZ

Cleaned for high purity semiconductor applications.

Cleanroom assembled and He leaked tested.

Valve meets dimensional requirements of

SEMI F36-0299, Option I.



M5 actuation port



Manually Operated Type Series AZ3652 and 4652

Compact and lightweight by modifying the knob design

RoHS

The knob is a unique design that combines a scalloped round knob with a raised rectangular section to provide two choices of gripping.

Actuation is 90 degrees open to closed with a cutout window, on both sides of raised rectangular section, providing visual status of open or closed state.



Close

Height



SMC

Air operated type Series AZ3542/AZ4542



Body material

316L SS Electropolish and passivation internals

SEMI standard

Mounting hole, dimension, and face to face dimension are interchangeable (Guide for Dimensions and Connections of Gas Distribution Components).

Multiple port available in various configurations

Manually operated type Series AZ3652/AZ4652



User-friendly forged body

Rounded corner for safety and easy operation (forged body is for machined type.)





Machined type

Welded type

	Mashinad		Wolded			
	Machined		welded			
Body						
Connection	Face seal fitting (Male)	Tube weld (Tube stub)	Face seal fitting (Male)	Face seal fitting (Female)	Tube weld (Tube stub)	
Connection size (inch)	1/4, 3/8 1/4, 3/8, 1/2		1/4, 3/8			
Interchangeability	No		Yes			

Welded type, inlet and outlet available with any combination of fitting type and size.

Further information How to order P.1110, 1112



Welded type, ports (2, 3, 4 ports) and porting configuration (flow direction 2, 3, 4) selectable

Further information Optional porting configuration P.1114

Air operated type

	Carias	Series Status Body material Max. operating pressure (MF	Max. operating	C ₁ (* 1)	Connections	Dama	
U U	Series		body material	pressure (MPa)	CV · ··	Fitting	Page
A REAL OF THE	AZ3542	NC	2161 66	0.0	0.29	Face seal fitting	D 1110
Machined type Welded t	ype AZ4542	N.C.	3101 55	0.9	0.5	Tube weld	P.1110

Manually operated type

	Sorios	Knob Body material M	Redu meterial	Max. operating	O (1) * 1)	Connections	Dogo
	Series		pressure (MPa)	Cv * 0	Fitting	Fage	
	AZ3652	Knob with a raised	0101 00	17	0.29	Face seal fitting	D 1110
Machined type Welded type	AZ4652	(indication window)	3101 35	1.7	0.5	Tube weld	P.1112

* 1) Cv calculation based on SEMI Standard



Series AZ Applicable Fluid

Precautions for selection -

The proper regulator and valve selection can be significantly affected by parameters such as system design, flow duration, frequency of use, ambient conditions and outlet pressure. It is important to understand that one may follow this guide's recommendation, yet have a failure due to a parameter specific to the given application, as noted.

Applicable Fluid

Process Gas	Molecular Formula	Process Gas	Molecular Formula
Boron11 Trifluoride	11BF3	Chlorine	Cl ₂
Argon	Ar	Chlorine Trifluoride	CIF3
Arsine	AsH₃	Carbon Monoxide	со
Boron Trichloride	BCl ₃	Carbon Dioxide	CO ₂
Boron Trifluoride	BF3	Germane	GeH4
Halocarbon114	C ₂ CIF ₄	Hydrogen	H ₂
Halocarbon115	C ₂ CIF ₅	Hydrogen Sulfide	H₂S
Halocarbon116	C ₂ F ₆	Hydrogen Selenide	H₂Se
Acetylene	C ₂ H ₂	Hydrogen Bromide	HBr
Halocarbon134A	C ₂ H ₂ F ₄	Hydrogen Chloride	HCI
Ethylene	C ₂ H ₄	Helium	Не
Halocarbon125	C ₂ HF ₅	Hydrogen Fluoride	HF
Dimethylsilane	C ₂ SiH ₈	Krypton	Kr
HalocarbonR218	C ₃ F ₈	Nitrogen	N2
Propene	C ₃ H ₆	Nitrogen Oxide	N2O
Propane	C ₃ H ₈	Neon	Ne
Perfluoro-butadiene	C ₄ F ₆	Nitrogen Trifluoride	NF3
HalocarbonC318	C ₄ F ₈	Ammonia	NH₃
Butene-1	C4H8	Nitric Oxide	NO
Octafluorocyclopentene	C ₅ F ₈	Oxygen	O ₂
Halocarbon12B2	CBr ₂ F ₂	Phosphorous Pentafluoride	PF₅
Halocarbon13B1	CBrF ₃	Phosphine	PH₃
Halocarbon12	CCl ₂ F ₂	Sulfer Tetrafluoride	SF4
Halocarbon13	CCIF ₃	Sulfer Hexafluoride	SF ₆
Halocarbon14	CF ₄	Disilane	Si ₂ H ₆
Halocarbon32	CH ₂ F ₂	Silicon Tetrachloride	SiCl ₄
Trimethylsilane	(CH ₃) ₃ SiH	Silicon Tetrafluoride	SiF4
Methyl Chloride	CH ₃ CI	Dichlorosilane	SiH2Cl2
Methyl Fluoride	CH₃F	Silane	SiH ₄
Methanol	CH ₃ OH	Trichlorosilane	SiHCl₃
Methylsilane	CH ₃ SiH ₃	Sulfur Dioxide	SO ₂
Methane	CH4	Diethyltelluride	Te (C ₂ H ₅) ₂
Halocarbon21	CHCl ₂ F	Tungsten Hexafluoride	WF ₆
Halocarbon23	CHF3	Xenon	Xe

· This applicable fluid is a reference guide and does not apply to product guarantee.

· Please consult SMC for a specific recommendation beyond the scope of this document.

\land Caution

Since the product specified here is used under various operating conditions, its compatibility with fluid and specific equipment must be decided by the person who designs the equipment or decided its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product regardless of any recommendation.

Proper installation, operation and maintenance are also required to assure safe, trouble free performance.

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Operating Parameters		AZ3542	AZ4542		
Status		Normally closed (N.C.)			
Gas		Select compatible materials of construction for the ga			
Operating pressure		Vacuum to 125 psig (0.9 MPa)			
Proof pressu	ure	200 psig (1.4 MPa)			
Burst pressu	ure	375 pisg	(2.7 MPa)		
Ambient and o	perating temperature	-10 to 71°C	(No freezing)		
Cv		0.29	0.5		
Look roto	Inboard leakage	2 x 10-11 Pa-m3/s			
Leak rate	Outboard leakage	2 x 10 ⁻¹⁰ Pa·m ³ /s *1)			
Across the s	seat leak	4 x 10 ⁻⁹ Pa·m ³ /s *1)			
Surface finis	sh	Ra 10μin. (0.25 μm)			
Connections	3	Face seal, Tube weld			
Actuation pr	ressure	60 to 110 psig (0.4 to 0.76 MPa)			
Actuation po	ort connection	M5 x 0.8			
Actuation port location		Тор			
Installation		Bottom mount			
Internal volume		0.06 in ³ (1.07 cm ³)			
Weight		0.24 kg *2)			

Wetted Parts	S
Body	316L SS
Surface finish	Electropolish + Passivation
Diaphragm	Ni-Co Alloy
Seat	PCTFE (Option: Polyimide)

* 1) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).

* 2) Weight for AZ3542S2PMV4MV4 including individual boxed weight. It may vary depending on connections or options.

Construction



Diaphragm Valve for Ultra High Purity Air operated type Series AZ3542 & 4542

Dimensions

(Machined)

TW6

TW8

0.875 (22.2)

1.125 (28.6)

inch (mm)



SMC

1.93

1.325

FV6

TW6

(49.0)

(33.7)



Please refer to page 1114.

Specifications

Operating Parameters		AZ3652	AZ4652		
Gas		Select compatible materials of construction for the gas			
Operating pressure		Vacuum to 250 psig (1.7 MPa)			
Proof press	ure	375 psig (2.6 MPa)			
Burst press	ure	750 psig	(5.1 MPa)		
Ambient and	operating temperature	-40 to 71 °C	(No freezing)		
Cv		0.29	0.5		
Look rate	Inboard leakage	2 x 10 ⁻¹¹ Pa·m ³ /s			
Leak rate	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 fini	sh	Ra 10 μin.(0.25 μm)			
Connection	S	Face seal, Tube weld			
Installation		Bottom mount			
Internal volume		0.06 in ³ (1.07 cm ³)			
Weight		0.22 kg *2)			
Knob		1/4 turn indicating round knob v	ith a raised rectangular section		

* 1) Tested with Helium gas inlet pressure 125 psig (0.9 MPa).

* 2) Weight for AZ3652S2PMV4MV4 including individual boxed weight. It may vary depending on connections.

Construction



Wetted Parts Material

Wetted Parts	S
Body	316L SS
Surface finish	Electropolish + Passivation
Diaphragm	Ni-Co Alloy
Seat	PCTFE (Option: Polyimide)

∕⊘SMC

Diaphragm Valve for Ultra High Purity Manually operated type Series AZ3652 & 4652

Dimensions

inch (mm)

2.17 (55)



BAR STOCK BODY 0.44 B 1 Α Connections: MVD, FVD



Connections: TW



Dorto	Commentione	Α		В	
Pons	Connections	inch	(mm)	inch	(mm)
	MV4	1 20	(05.0)		
	FV4	1.55	(35.5)		
2PW	TW4	1.06	(26.9)	1 12 00	(20 4)
(Welded)	MV6	1 02	(40.0)	1.12 54.	(20.4)
	FV6	1.95	(49.0)		
	TW6	1.325	(33.7)		

	AP
1	
	SL
1	
	AZ
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- î	
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Made to Order

Optional knob color available. Red, blue, green, gold, silver, purple, etc. Please contact SMC for further information.



Series AZ / Diaphragm Valve Optional Porting Configuration



Port Configuration

- · Valves are illustrated top view looking down through the valve.
- Inlet (Upstream) is defined as a port connected to the region below the valve seat. It is illustrated with an arrow pointing towards the valve body or an "empty" triangle on the schematic. Outlet (Downstream) is defined as a port connected to the region above the seat and below the diaphragm. It is illustrated with an arrow pointing away from the valve body or a "filled" triangle on the schematic.
- The traditional flow direction is INLET to OUTLET, but AP Tech valves may be employed in either flow direction.
- · End connections are specified in numerical order per the diagram's numbered arrows.

