



ULTRA FAST DIAPHRAGM VALVE



Patent pending
US 61/910,079

ULTRA-HIGH PURITY DIAPHRAGM VALVES FOR ATOMIC
LAYER DEPOSITION AND FAST SWITCHING APPLICATIONS



ULTRA CLEAN VALVES



IN-LINE METAL DIAPHRAGM PNEUMATICALLY-OPERATED ULTRA FAST VALVES

The Ultra-Fast series is designed for atomic layer deposition applications, high cycling, high temperature and ultra-high purity processes, under severe repeatability demands. With its unique (patent pending No. US61/910,079) flow adjustment mechanism, this series allows flow fine-tuning during operation. Optional extended bonnet and cooling fin provide superb solution for high temperature applications.

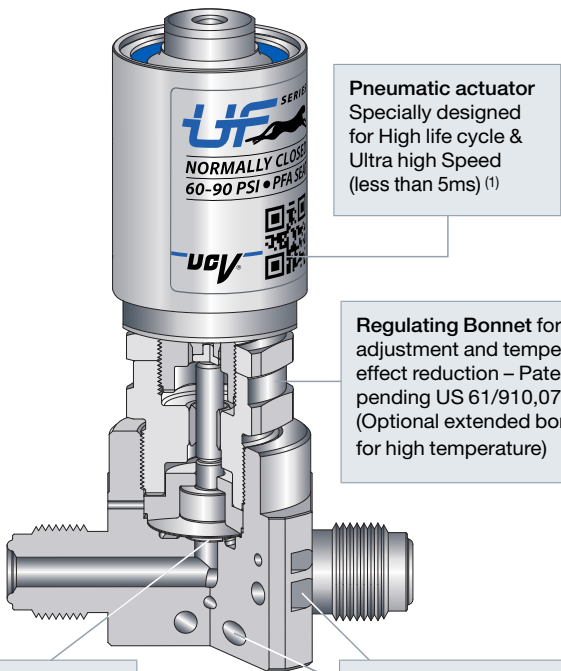


IN-LINE VALVE SPECIFICATIONS	
Structure	Direct-seal metal-diaphragm valve without seal packing Pneumatically operated
Pressure	Vacuum to 150 psi (10 bar)
Temperature: Standard bonnet	14 to 248°F (-10 to 120°C)
Extended bonnet	14 to 392°F (-10 to 200°C)
Leakage: Inboard Leakage	≤ 3x10 ⁻¹¹ atm cc He/sec
Across the seat	≤ 1x10 ⁻⁹ atm cc He/sec (1)
Particulate	No particulate detected above 0.1µm.
Operated	High speed Pneumatic, NC*
CV value	0.25 / 0.6, Adjustable
Port configurations	2-port straight, 2-port L, 3-port, 4-port
Surface Finish Ra (Ave)-Standard	5µin, Electropolished surface
Air Supply	60-90 psig (4 - 6 bar)
Valve Response Time	Less than 5ms (1)
Air Connection	M5

MATERIALS		
Item No.	Part No.	Material
1*	Body	Stainless steel, 316L VAR or VIM/VAR**
2*	Seat (Caulked)	PFA
3*	Diaphragm	Co-Cr-Ni Alloy
4	Act. Button	Stainless steel, 316L
5	Act. Button Holder	Stainless steel, ASTM 630 H900
6	Bushing	Carbon steel + PTFE
7A	Regulating Bonnet	Stainless steel, 316L
7B	Extended Regulating Bonnet	Stainless steel, 316L
8	Connection Rod	Stainless steel, 304
9	Locking Nut	Stainless steel, 304
10	Actuator Assembly	Stainless steel, 316L
11	Cooling Fin	Aluminium 6061

*Wetted parts ** Per SEMI F20

(1) For 1/4" body size, for valve only
*NC-Normally Closed

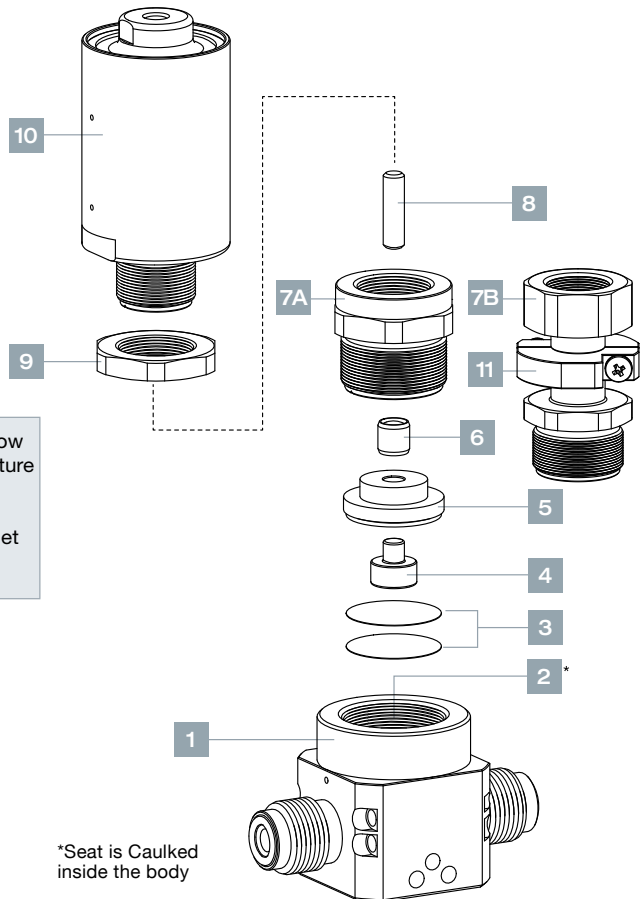


Pneumatic actuator
Specially designed for High life cycle & Ultra high Speed (less than 5ms) (1)

Regulating Bonnet for flow adjustment and temperature effect reduction – Patent pending US 61/910,079 (Optional extended bonnet for high temperature)

PFA seats for high temperature, up to 200°C & high life cycle

Cartridge heaters and thermocouples holes as an option



*Seat is Caulked inside the body



SURFACE-MOUNT, METAL DIAPHRAGM PNEUMATICALLY-OPERATED ULTRA FAST VALVES

The surface mount design complies with SEMI PR 3.1 for 1.112" C-seal. This series is manufactured according to UHP specifications of SEMI F-20 with pneumatic operating mechanisms.

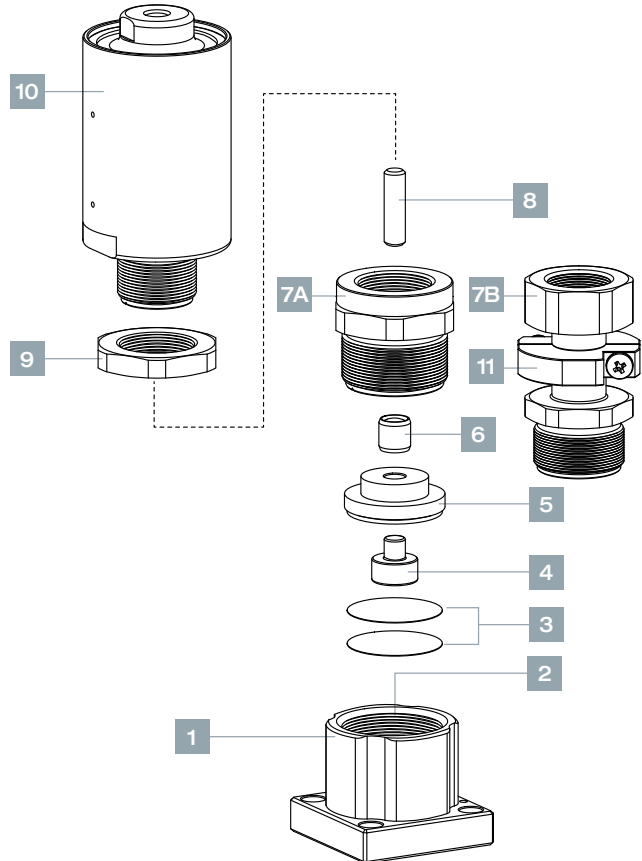


SURFACE-MOUNT VALVE SPECIFICATIONS	
Structure	Direct-seal metal-diaphragm valve without seal packing Pneumatically operated
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Temperature: Standard bonnet	14 to 248°F (-10 to 120°C)
Extended bonnet	14 to 392°F (-10 to 200°C)
Leakage: Inboard Leakage	$\leq 3 \times 10^{-11}$ atm cc He/sec
Across the seat	$\leq 1 \times 10^{-9}$ atm cc He/sec (1)
Particle	No particle detected above 0.1µm.
Operated	High speed Pneumatic, NC*
CV value	0.25 / 0.6, Adjustable
Port configurations	2-port, 3-port
Surface Finish Ra (Ave)-Standard	5µin, Electropolished surface
Air Supply	60-90 psig (4 - 6 bar)
Valve Response Time	Less than 5ms (1)
Air Connection	M5

(1) For 1/4" body size, for valve only
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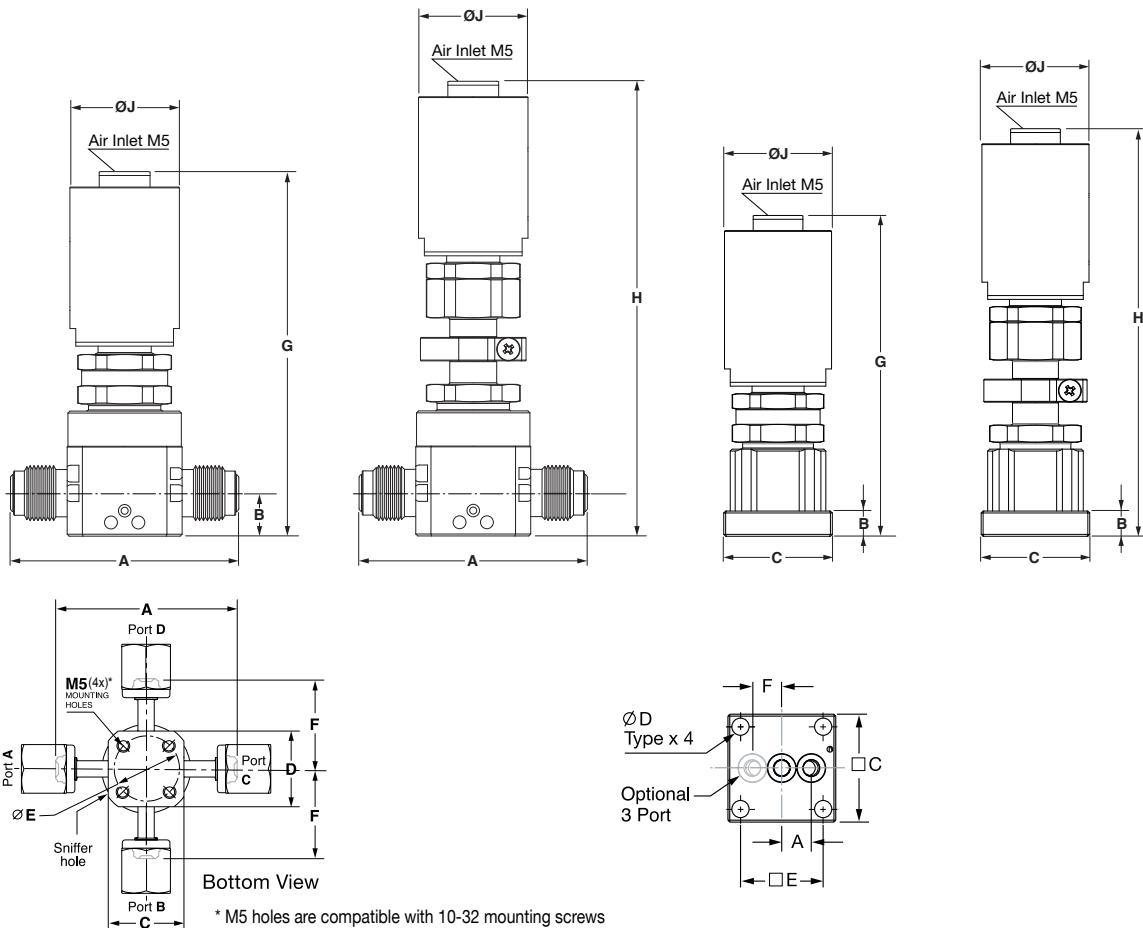
STANDARD CONFIGURATION DIMENSIONS

ULTRA CLEAN VALVES

VALVE DIMENSIONS - INCH (MM)

Body Size	SERIES	End Connection	A		B		C		D		E		F		G		H		J	
			in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
1/4"	UF	Male face seal	2.30	58.4	0.43	11.0	1.16	29.4	1.16	29.4	1.00	25.4	1.15	29.2	3.69	93.8	4.62	117.3	1.10	28.0
		Swivel male face seal	2.78	70.6									1.39	35.3						
		Swivel female face seal	2.78	70.6									1.39	35.3						
		Butt weld	1.75	44.4									0.88	22.2						
	UFS	Surface mount	0.30	7.7	0.26	6.6	1.12	28.4	0.17	4.4	0.85	21.7	0.30	7.7	3.33	84.6	4.26	108.1	1.10	28.0
1/2"	UF	Male face seal	2.99	76.0	0.69	17.5	1.46	37.0	1.46	37.0	1.10	28.0	1.50	38.0	4.93	125.3	5.86	148.8	1.34	34.0
		Swivel male face seal	3.93	100.0									1.97	50.0						
		Swivel female face seal	3.93	100.0									1.97	50.0						
		Butt weld	2.16	55.0									1.08	27.5						
	UFS	Surface mount	0.46	11.6	0.31	8.0	1.50	38.1	0.20	5.2	1.19	30.2	0.46	11.6	4.45	113.2	5.38	136.8	1.34	34.0

Dimensions are for reference only, and are subject to change.



ORDERING INFORMATION

Valve Description Example:

OPTIONAL

UF 2 0 - 4 V F LC - BW 4 GF 4

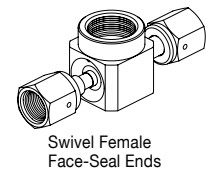
Port (A) Port (B)

Valve Series		Port Designator		Body Material		Actuation Device		End Size		High temp. Options		Heating Option ⁽³⁾	
UF	Inline	0,1,2,3,4,5		V	SS316L VAR or VIM/VAR(1)	LC	Air Operated N.C.	4	1/4"	X	Extender	H	Cartridge Holes for Thermocouple and Heater
UFS	Surface mount							6*	3/8"	F	Extender with fin	H1	Cartridge Holes with Thermocouple
								8	1/2"			H2	Cartridge Holes with Heater
								* For BW Only		Control options		H3	Cartridge Holes with Thermocouple and Heater
										D	Solenoid valve, DC		
										LS	Limit switch		

Valve Type	Body Designator	Seat Material	End Connection ⁽²⁾
2	2-Port Valve	4	1/4" Body
3	3-Port Valve	8	1/2" Body
4	4-Port Valve ⁽²⁾	F	PFA
		BW	Butt Weld
		GF	Swivel female Face-seal
		GM	Swivel male Face-seal
		M	Male Face-seal

(1) Per SEMI F20-0305 | (2) For inline valves only | (3) 1/8 in. through holes For UF20 valves only

PORT DESIGNATOR - (TOP VIEW)								
Valve Configuration	Port Designator	Schematic Flow Chart	Valve Configuration	Port Designator	Schematic Flow Chart	Valve Configuration	Port Designator	Schematic Flow Chart
2 Port Valve UF2_ 	0		3 Port Valve UF3_ 	0		4 Port Valve UF4_ 	0	
	1			1			1	
	2			2			2	
				3			3	
				4				
				5				



Warning!

The system designer and user have the sole responsibility for selecting products suitable for their special application requirements, ensuring their safe and trouble-free installation, operation, and maintenance. Application details, material compatibility and product ratings should all be considered for each selected product. Improper selection, installation or use of products can cause property damage or personal injury.

UCV UF, Rev.00, January 2014

