

ULTRA-CLEAN DIAPHRAGM VALVES



ULTRA CLEAN VALVES

UCV[®] SERIES



 **HAM-LET[®]**
ADVANCED CONTROL TECHNOLOGY



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UCV MODEL SELECTION TABLE

Make the initial choice, taking the application parameters into account.

ULTRA CLEAN VALVES

Pressure	Temperature	Gas	Seat Material	Cv	Valve Type	
					UHP Grade	HP Grade
Low-Pressure ≤ 1MPa (150 psi)	-10~60°C (14~140°F)		PCTFE	~0.1	2LE	
					2LM	
				~0.3	2LD	EV
					2LC	EVZ
				HM*	HD*	
				~0.7	2LD	EV
						EVZ
				~2.5	2LDS12	
	-10~150°C (14~300°F)	Inert Gas	PI	~0.1	2LE	
					2LM	
~0.3				2LD	EV	
				~0.7	2LC	EVZ
					HM*	
				~0.7	2LD	EV
					EVZ	
Active Gas	METAL	~0.3	HMS			
		~0.1	3LE			
		~0.3	3LD			
				3LN		
			~0.7	3LD		
-10~200°C (14~392°F)		PFA	~0.25	UF		
				UF		
-10~250°C (14~480°F)		METAL	~0.7	3LT		
High-Pressure ≤ 21MPa (3060 psi)	-10~60°C (14~140°F)	PCTFE	~0.1	2LH**	EVH**	
				HP		
	-10~40°C (14~100°F)	PCTFE + 316L Stainless Steel	~0.3	2LS		
	-10~150°C (14~300°F)	Inert Gas	PI	~0.1	2LH**	EVH**
					2LS	
			~0.3	2LS		
Active Gas	METAL	~0.1	3LH			
			3LS			

* 300 psi as an option
** 2300 psi as a standard

HP - High Purity
UHP - Ultra High Purity

BASIC UCV STRUCTURES, GRADES AND SPECIFICATIONS

- UCVs are metallic diaphragm-operated valves. The diaphragm is made of a Ni-Co Alloy.
- UCVs are available with the following valve structures to meet ultra-high purity (UHP) and high-purity (HP) grades:

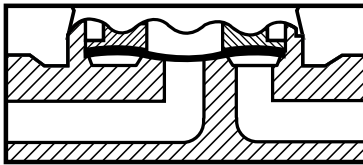
A. All-metallic valves - the highest UHP grade.

These valves are designed to be the ultimate solution, with polymer materials eliminated from their gas contact areas. Ideally suited for use with high-reactivity gases and in applications requiring fast gas replacement. It is also best suited for use as supply system valves for high-reactivity

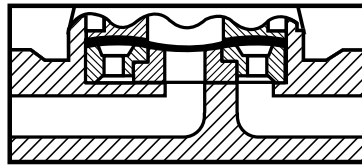
- B.** Soft-seat valves, standard UHP grade/standard HP grade. HAM-LET MOTOYAMA Japan's standard line of valves using PCTFE (polymonochlorotrifluoroethylene) in the standard valve seats. The seat holders minimize the dead volume on the seat bottom, designed for enhanced reliability.

- C.** Caulked-seat valves, general-purpose HP grade. HP valves using PCFTE (polymonochlorotrifluoroethylene) seats. Minimized seat volumes ease the problems of outgassing and seat creeping in line with the traditional design philosophy of UCV's.

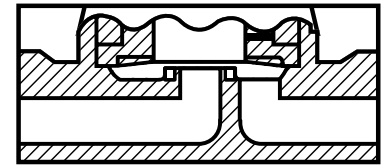
A. All-metallic valve



B. Soft-seat valve



C. Caulked-seat valve



HIGHEST UHP** GRADE, 3L SERIES

Type	Size (inch)	Cv	Max. Working Pressure	Working Temp.	Application	Drive	Feature
3LD	1/4 - 1/2	0.25 - 0.7	1MPa/150psi	-10~150°C	On-Off	Manual and Pneumatic	Multiuse
3LS	1/4 - 1/2	0.23 - 0.25	21MPa/3060 psi	-10~150°C	On-Off	Manual and Pneumatic	High-Pressure High Flow
3LT	1/2	0.7	1MPa/150 psi	-10~250°C	On-Off	Manual and Pneumatic	High-Temperature Use
3LH	1/8- 1/4	0.1	16MPa/2300 psi	-10~150°C	On-Off	Manual and Pneumatic	High-Pressure Use
3LE	1/8- 1/4	0.05-0.1	1MPa/150 psi	-10~150°C	On-Off	Manual and Pneumatic	Compact

STANDARD UHP** GRADE, 2L SERIES

Polyimide (PI) seat is optionally selectable: working tmp.=-10 to 150°C

Type	Size (inch)	Cv	Max. Working Pressure	Working Temp.	Application	Drive	Feature
2LE	1/4	0.05 - 0.1	1MPa/150 psi	-10~60°C	On-Off	Manual and Pneumatic	Compact
2LM	1/4	0.05 - 0.1	1MPa/150 psi	-10~60°C	Flow Control	Graduated Manual	Compact
2LD	1/4 - 1/2, 3/4	0.3 - 0.7, 2.2	1MPa/150 psi	-10~60°C	On-Off	Manual and Pneumatic	Multiuse
2LH	1/4	0.05 - 0.1	16.2MPa/2300 psi Option: 21MPa/3060 psi	-10~60°C	On-Off	Manual and Pneumatic	High-Pressure Use
HM	1/4	0.3	1MPa/150 psi Option: 2MPa/300 psi	-10~60°C	On-Off	Manual and Pneumatic	Multiuse
HMC	1/4	0.25	1MPa/150 psi	-10~60°C	On-Off	Manual and Pneumatic	Multiuse
HMS	1/4	0.3	1MPa/150 psi Option: 2MPa/300 psi	-10~60°C	On-Off	Manual and Pneumatic	Multiuse
HMSC	1/4	0.27	1MPa/150 psi	-10~60°C	On-Off	Pneumatic	Multiuse
2LN HB	1/4	0.3	1MPa/150 psi Option: 2MPa/300 psi	-10~60°C	On-Off	Manual and Pneumatic	Multiuse
HMB	1/4	0.3	1MPa/150 psi Option: 2MPa/300 psi	-10~60°C	On-Off	Manual and Pneumatic	Multiuse

STANDARD HP* GRADE, EV & EVZ SERIES

Polyimide(PI) seat is optionally selectable: working tmp.=-10 to 150°C

Type	Size (inch)	Cv	Max. Working Pressure	Working Temp.	Application	Drive	Feature
EV	1/4 - 1/2	0.3 - 0.7	1MPa/150 psi	-10~60°C	On-Off	Manual and Pneumatic	Multiuse
EVH	1/4	0.1	16.2MPa/2300 psi Option: 21MPa/3060 psi	-10~60°C	On-Off	Manual and Pneumatic	High-Pressure Use
EVZ	1/4-1/2	0.27-0.65	1MPa/150 psi	-10~80°C	On-Off	Manual	Caulked Seat

NOTE: Choose your valve seat material from the Valve Seat Selection Table (page 417) in this catalog.

*HP - High Purity

**UHP - Ultra High Purity

2LE SERIES

COMPACT MODEL

Metal Diaphragm Valves

Compact models from the Ultra Clean Valve series are made according to UHP specifications.

These models come with connection joints in 1/4", as a standard.

These valves fit into applications to which a minimum footprint is required.

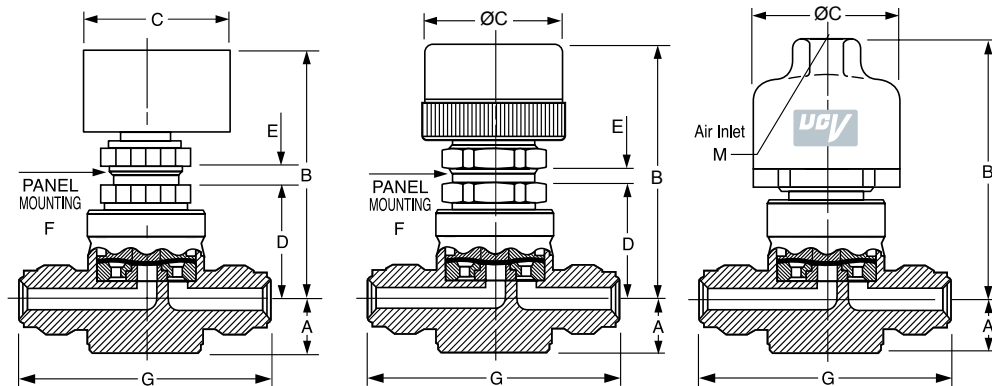
- Compact designs for minimum footprint.
- A large choice of fluid-specific seat materials is available as an option.
- Electropolished surfaces



For details, please contact one of our field representatives.

STANDARD CONFIGURATION DIMENSIONS

Part Number/ep	Size	End Connection	A	B	C	D	E	F	G	I	J	K	M
2LES4Q-W	1/4	Extended Butt Weld	11	(52)	30	24.5	(4)	17	47			17	
2LEA4R-BV	1/4	Male HTC®	11	(54)	30	24.5	(4)	17		26	45	17	
2LES4C-FV	1/4	Swivel Female HTC®	11	(54)	32				66			17	Rc1/8



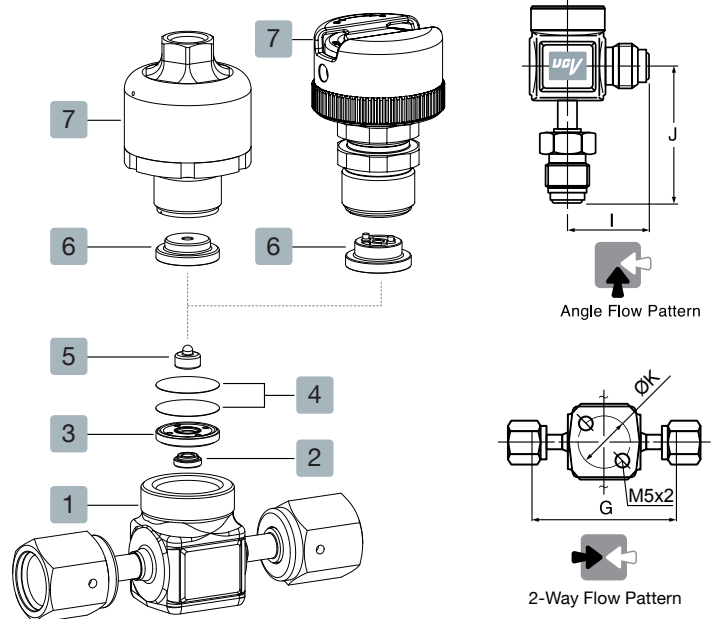
SPECIFICATIONS					
Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/4	1MPa (150 psi)	-10 to 60°C (PCTFE) -10 to 150°C (PI)	0.1	3X10 ⁻¹² pa•m ³ /sec Helium	3X10 ⁻¹⁰ pa•m ³ /sec Helium

STRUCTURE		
Parts	Material	
1 Body	Stainless steel, 316L Var or Vim/Var (1)	
2 Seat	PCTFE/PI (Polyimide)	
3 Seat Holder	Stainless steel, 316L Var or Vim/Var (1)	
4 Diaphragm	Co-Cr-Ni Alloy	
5 Act. Button	304 Stainless Steel	
6 Act. Button Holder	Stainless Steel, ASTM 630 H900	
7 Actuation Device	Aluminum	

(1) Per SEMI F20-0305

ORDERING INFORMATION

For ordering, see page 416



2LM SERIES FLOW CONTROL

Metal Diaphragm Valves

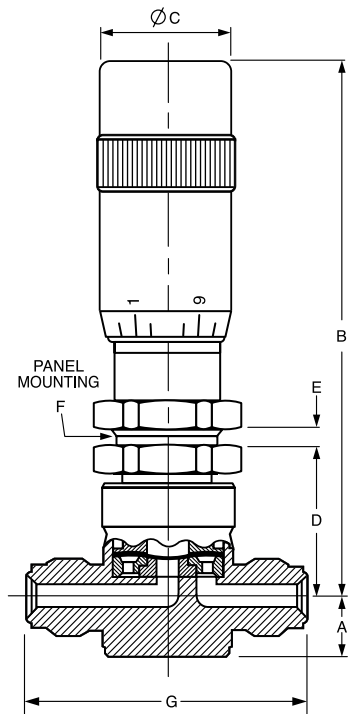
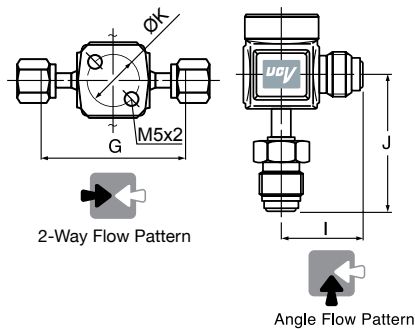
Flow control models from the Ultra-Clean Valve Series are made according to UHP specifications. These models come with connection joints in 1/4", as a standard. Each valve is furnished with a handle-lock set screw with a vernier scale.

- Broad flow-control range of six and a half turns of the handle.
- A handle-lock set screw on the handle side.
- Electropolished surfaces

As these valves are designed to handle flow control tasks, the valve seat is not fully closed even at the position of division 0 on the vernier scale. Do not operate the handle in the direction in which the valve seat is closed past the position of division 0 on the vernier scale.



STANDARD CONFIGURATION DIMENSIONS												
Part Number/ep	Size	End Connection	A	B	C	D	E	F	G	I	J	K
2LMS4V-W	1/4	Extended Butt Weld	11	(98)	23	26	(2.5)	20	47			17
2LMS4V-BW	1/4	Short Butt Weld	11	(98)	23	26	(2.5)	20	44.4			17
2LMA4V-BV	1/4	Male HTC®	11	(98)	23	26	(2.5)	20		26	45	17
2LMS4V-FV	1/4	Swivel Female HTC®	11	(98)	23	26	(2.5)	20	66			17



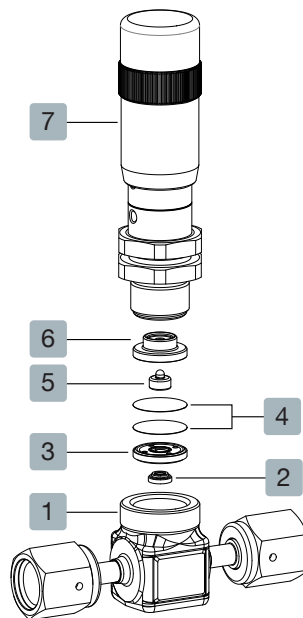
SPECIFICATIONS					
Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/4	1MPa (150 psi)	-10 to 60°C (PCTFE) -10 to 150°C (PI)	0.1	3X10 ⁻¹² pa•m ³ /sec Helium	Not a Shutoff Valve

STRUCTURE		
Parts	Material	
1 Body	Stainless steel, 316L Var or Vim/Var (1)	
2 Seat	PCTFE/PI (Polyimide)	
3 Seat Holder	Stainless steel, 316L Var or Vim/Var (1)	
4 Diaphragm	Co-Cr-Ni Alloy	
5 Act. Button	304 Stainless Steel	
6 Act. Button Holder	Stainless Steel, ASTM 630 H900	
7 Actuation Device	Aluminum	

(1) Per SEMI F20-0305

ORDERING INFORMATION

For ordering, see page 416



2LD SERIES STANDARD MODEL

Metal Diaphragm Valves

Standard models from the Ultra-Clean Valve Series are made according to UHP specifications.

This model comes with connection joints in three sizes 1/4", 3/8" & 1/2" as a standard.

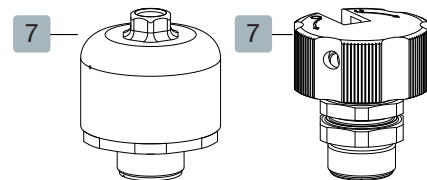
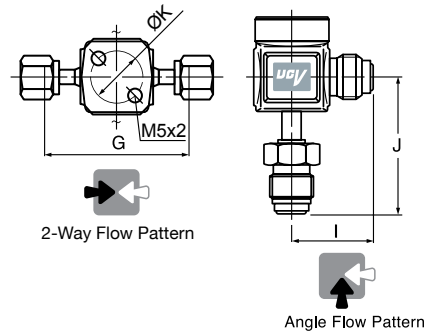
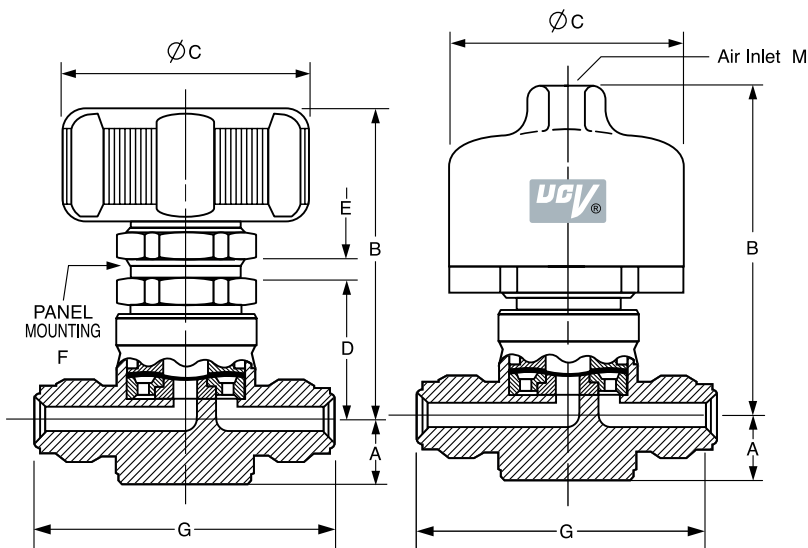
This valve comfortably fits into high-flow applications.

- Unique seat structure offers superb leak performance.
- Compact designs for a minimum foot print.
- Electropolished surfaces



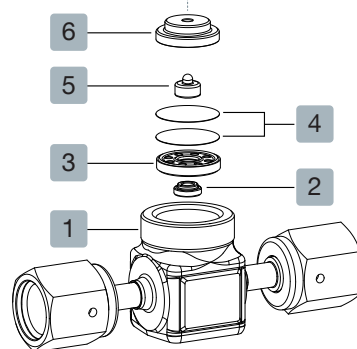
STANDARD CONFIGURATION DIMENSIONS

Part Number/ep	Size	End Connection	A	B	C	D	E	F	G	H	I	J	K	M
2LDA4R-BV	1/4	Male HTC®	11	(63)	45	29	(4)	23	58	25	29	45	25	
2LDS4C-W	1/4	Extended Butt Weld	11	(65)	46				89				25	Rc1/8
2LDS4C-BW	1/4	Short Butt Weld	11	(65)	46				44.4				25	Rc1/8
2LDS6R-W	3/8	Extended Butt Weld	17.5	(67.5)	45	32.5	(4)	23	105	38			28	
2LDS8C-FV	1/2	Female HTC®	17.5	(73.5)	56				100				28	Rc1/8
2LDS8C-W	1/2	Extended Butt Weld	17.5	(73.5)	56				105				28	Rc1/8



SPECIFICATIONS					
Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/4	1MPa (150 psi)	-10 to 60°C (PCTFE) -10 to 150°C (PI)	0.3	3X10 ⁻¹²	3X10 ⁻¹⁰
3/8			0.7	pa•m ³ /sec Helium	pa•m ³ /sec Helium
1/2			0.7		

STRUCTURE		
Parts	Material	
1 Body	Stainless steel, 316L Var or Vim/Var ⁽¹⁾	
2 Seat	PCTFE/PI (Polyimide)	
3 Seat Holder	Stainless steel, 316L Var or Vim/Var ⁽¹⁾	
4 Diaphragm	Co-Cr-Ni Alloy	
5 Act. Button	304 Stainless Steel	
6 Act. Button Holder	Stainless Steel, ASTM 630 H900	
7 Actuation Device	Aluminum	



ORDERING INFORMATION
For ordering, see page 416

⁽¹⁾ Per SEMI F20-0305

2LDS12 SERIES

3/4" HIGH-FLOW

Metal Diaphragm Valves

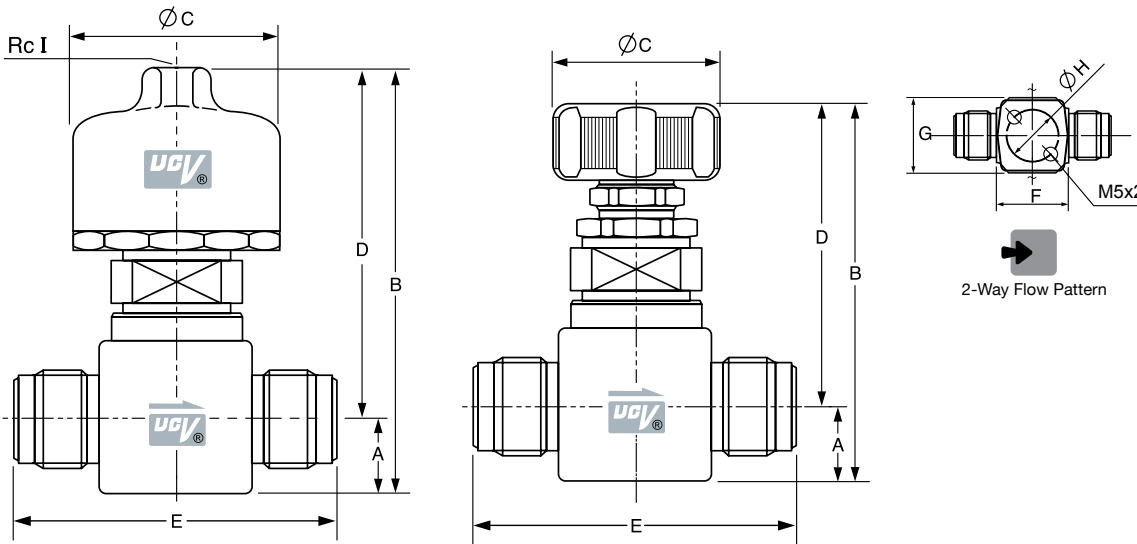
Standard models from the Ultra-Clean Valve Series are made according to UHP specifications. This model comes with connection joints in 3/4" as a standard. This valve comfortably fits into high-flow applications.

- Unique seat structure offers superb leak performance.
- Compact designs for minimum foot print.
- Electropolished surfaces



STANDARD CONFIGURATION DIMENSIONS

Part Number/ep	Size	End Connection	A	B	C	D	E	F	G	H	I
2LDS12R-BV	3/4	Male HTC®	23	109	45	86	97	46	45	35	
2LDS12R-FV	3/4	Swivel Female HTC®	23	109	45	86	146	46	45	35	
2LDS12R-W	3/4	Extended Butt Weld	23	109	45	86	146	46	45	35	
2LDS12C-BV	3/4	Male HTC®	23	118	56	95	97	46	45	35	Rc 1/8
2LDS12C-FV	3/4	Swivel Female HTC®	23	118	56	95	146	46	45	35	Rc 1/8
2LDS12C-W	3/4	Extended Butt Weld	23	118	56	95	146	46	45	35	Rc 1/8



SPECIFICATIONS

Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
3/4	1MPa (150 psi)	-10 to 60°C	2.2	3X10 ⁻¹² pa•m ³ /sec Helium	3X10 ⁻⁹ pa•m ³ /sec Helium

STRUCTURE

	Parts	Material
1	Body	316L Stainless Steel
2	Seat	PCTFE/PI (Polyimide)
3	Diaphragm	Co-Cr-Ni Alloy
4	Handle/Act	Aluminum

ORDERING INFORMATION
For ordering, see page 416

EV SERIES

LOW-PRESSURE MODEL

Metal Diaphragm Valves

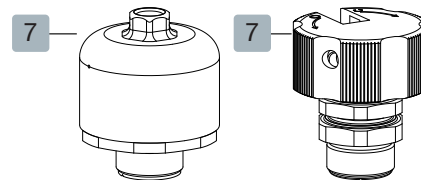
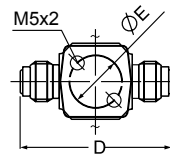
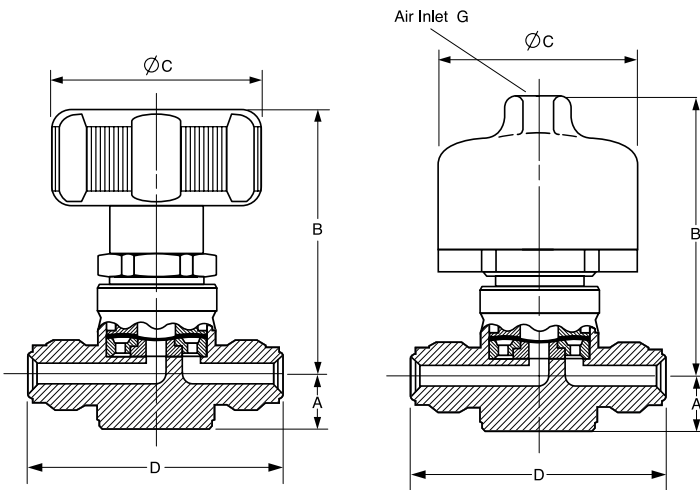
The EV Series is a family of standard models from the Ultra Clean Valve Series, which are made according to HP specifications. These models come with connection joints in three sizes, 1/4", 3/8" and 1/2", as standard. These valves implement the traditional UCV 2LD Series design concept of high reliability.

- Surface roughness of the gas contact area held to $Ry \leq 2.5$ micro meter as standard.
- Operable over a wide range of flow rates up to 1 MPa/150 psi.
- Electropolish surfaces as an option ("-EP").



STANDARD CONFIGURATION DIMENSIONS

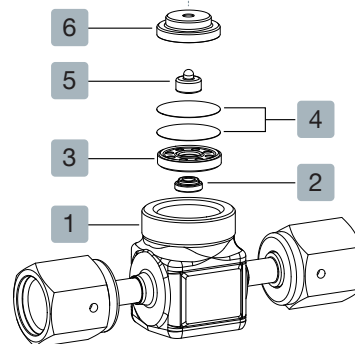
Part Number/ep	Size	End Connection	A	B	C	D	E	G
EV4-I	1/4	LET-LOK®	11	(63)	45	(63.5)	25	
EV4C-FV	1/4	Swivel Female HTC®	11	(65)	46	70.6	25	Rc1/8
EV4-BV	1/4	Male HTC®	11	(63)	45	58	25	
EV6-I	3/8	LET-LOK®	17.5	(67.5)	45	(79.4)	28	
EV8-I	1/2	LET-LOK®	17.5	(67.5)	45	(86)	28	
EV8C-FV	1/2	Swivel Female HTC®	17.5	(73.5)	56	100	28	Rc1/8
EV8-BV	1/2	Male HTC®	17.5	(67.5)	45	76	28	



SPECIFICATIONS					
Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/4	1MPa (150 psi)	-10 to 60°C (PCTFE)	0.3	3 X 10 ⁻¹²	3 X 10 ⁻¹⁰
3/8		-10 to 150°C (PI)	0.7	Pa m3/sec Helium	Pa m3/sec Helium
1/2			0.7		

STRUCTURE		
Parts	Material	
1	Body	316L Stainless Steel (1)
2	Seat	PCTFE/PI (Polyimide)
3	Seat Holder	316L Stainless Steel
4	Diaphragm	Co-Cr-Ni Alloy
5	Act. Button	304 Stainless Steel
6	Act. Button Holder	Stainless Steel, ASTM 630 H900
7	Actuation Device	Aluminum

(1) Single melt - VOD



ORDERING INFORMATION
For ordering, see page 416

EVZ SERIES

GENERAL PURPOSE

Metal Diaphragm Valves

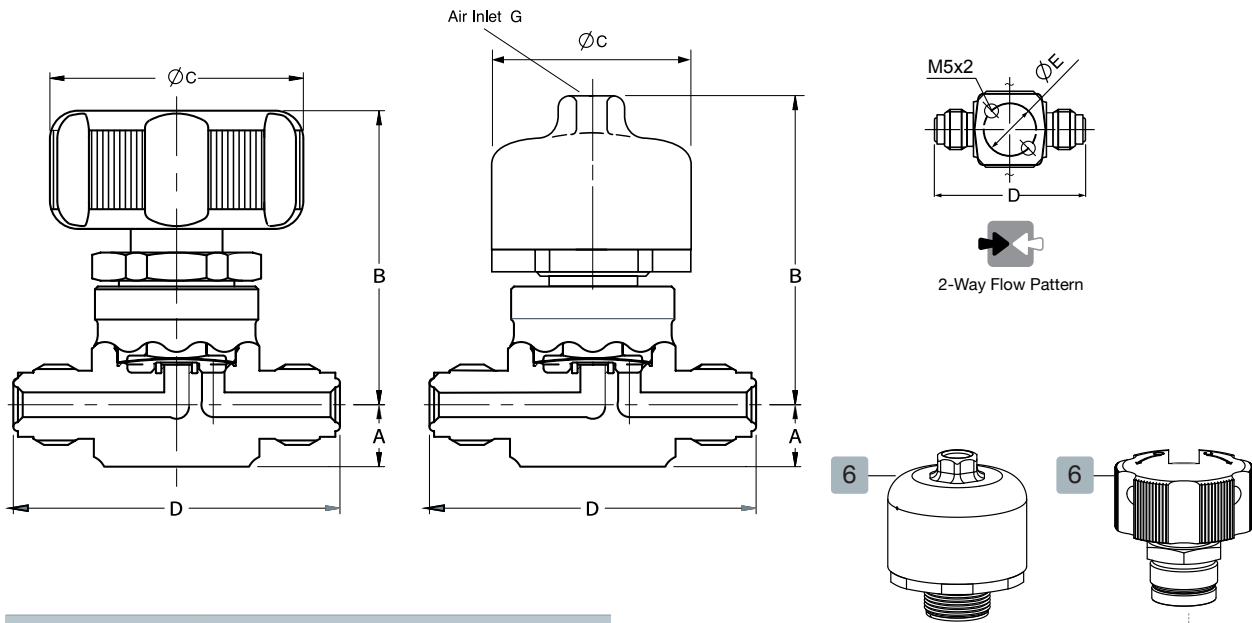
Economic implementations of Ultra-Clean Valves follow the traditions of HMJ UCV technologies.

- Available in sizes from 1/4" to 1/2" to support a wide range of connections.
- Standard with a 270-degree rotary handle with an open/close indicator.
- Over 20,000 open/close cycles.
- Electropolished item standard (LET-LOK® joint unpolished).
- Aluminum handle for compact, lightweight geometry.



The open/close indicator works on a follow-up basis. When opening or closing the valve, operate the handle until the handle hits the stopper.

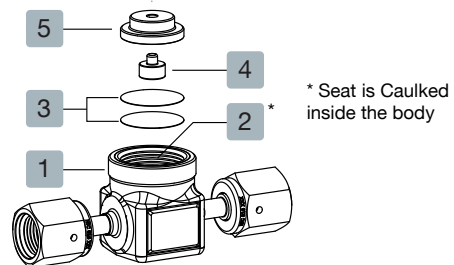
PART NUMBER / DIMENSIONS							
Part Number/ep	Size	End Connection	A	B	C	D	E
EVZS4R-BV	1/4	Male HTC®	11	(53)	45	58	25
EVZS4R-FV	1/4	Swivel Female HTC®	11	(53)	45	70.6	25
EVZS4R-I	1/4	LET-LOK®	11	(53)	45	(63.5)	25
EVZS6R-I	3/8	LET-LOK®	17.5	(58)	45	(79.5)	28
EVZS8R-BV	1/2	Male HTC®	17.5	(58)	45	76	28
EVZS8R-FV	1/2	Swivel Female HTC®	17.5	(58)	45	100	28
EVZS8R-I	1/2	LET-LOK®	17.5	(58)	45	(86)	28



SPECIFICATIONS					
Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/4	1MPa (150 psi)	-10 to 80°C	0.27	3X10 ⁻¹²	3X10 ⁻¹⁰
3/8				pa•m ³ /sec	pa•m ³ /sec
1/2				Helium	Helium

STRUCTURE		
Parts	Material	
1	Body	316L Stainless Steel (1)
2	Seat (Caulked)	PCTFE
3	Diaphragm	Co-Cr-Ni Alloy
4	Act. Button	304 Stainless Steel
5	Act. Button Holder	Stainless Steel, ASTM 630 H900
6	Actuation Device	Aluminum

(1) Single melt - VOD



ORDERING INFORMATION
For ordering, see page 416

2LH SERIES HIGH-PRESSURE

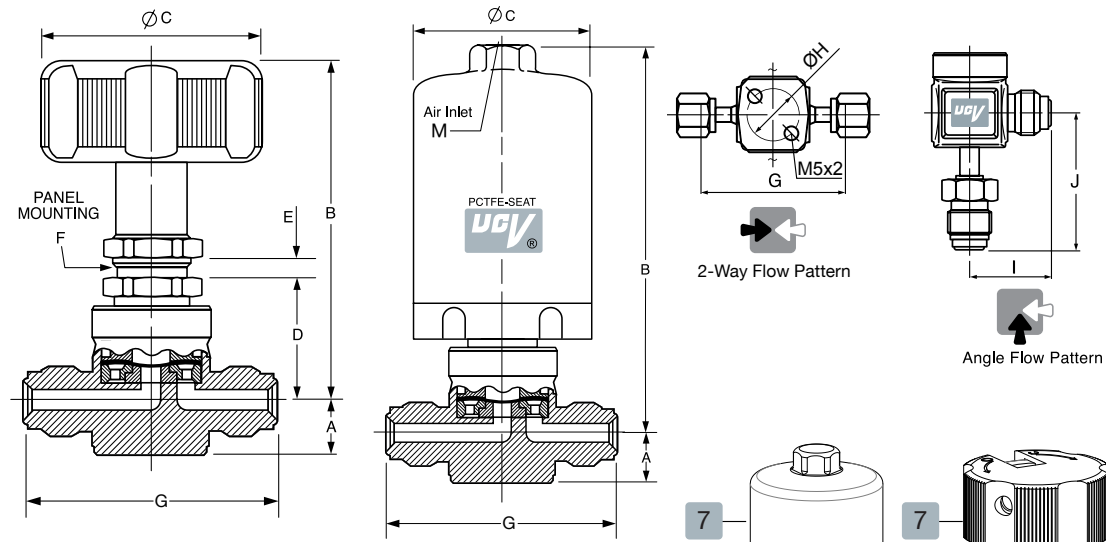
Metal Diaphragm Valves

High-pressure standard models from the Ultra-Clean Valve Series are made according to UHP specifications. These models come with connection joints in 1/4", as a standard. Features include a compact drive geometry and a highly reliable seat structure.

- Can be used as shutoff valves for high-pressure fluids at up to 16.2 MPa/2300 psi.
 - Compact designs for minimum footprint.
 - Electropolished surfaces
 - Optionally ready for 21 MPa/3060 psi (*For 3060 psi, add "-210K" to the valve description).
- For more information, please contact one of our field representatives.



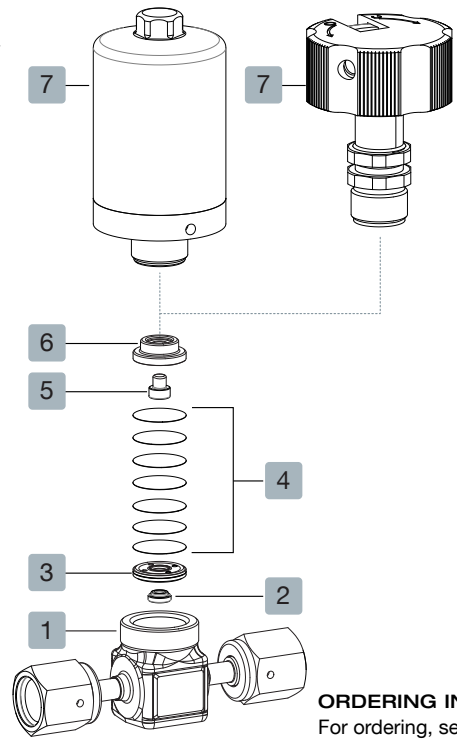
STANDARD CONFIGURATION DIMENSIONS													
Part Number/ep	Size	End Connection	A	B	C	D	E	F	G	H	I	J	M
2LHS4R-W	1/4	Extended Butt Weld	11	(68)	45	25	(2.5)		47	17			
2LHS4R-BW	1/4	Short Butt Weld	11	(68)	45	25	(2.5)		44.4	17			
2LHA4R-BV	1/4	Male HTC®	11	(68)	45		(2.5)			17	26	45	
2LHS4C-FV	1/4	Swivel Female HTC®	11	(85)	40	25		26	66	17			Rc1/8



SPECIFICATIONS					
Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/4	16.2MPa (2300 psi) OPTION: 21MPa/3060 psi	-10 to 60°C (PCTFE) -10 to 150°C (PI)	0.1	3X10 ⁻¹² pa•m ³ /sec Helium	3X10 ⁻¹⁰ pa•m ³ /sec Helium

STRUCTURE		
Parts	Material	
1 Body	Stainless steel, 316L Var or Vim/Var (1)	
2 Seat	PCTFE/PI (Polyimide)	
3 Seat Holder	Stainless steel, 316L Var or Vim/Var (1)	
4 Diaphragm	Co-Cr-Ni Alloy	
5 Act. Button	304 Stainless Steel	
6 Act. Button Holder	Stainless Steel, ASTM 630 H900	
7 Actuation Device	Aluminum	

(1) Per SEMI F20-0305



ORDERING INFORMATION:
For ordering, see page 416

2LS SERIES

HIGH-PRESSURE - HIGH-FLOW

Metal Diaphragm Valves

High-Pressure High-Flow models from the Ultra-Clean Valve Series are made according to UHP specifications. These models come with connection joints in two alternative sizes, 1/4" and 1/2", as a standard. With their compact designs, these valves comfortably fit into High-Pressure High-Flow applications.

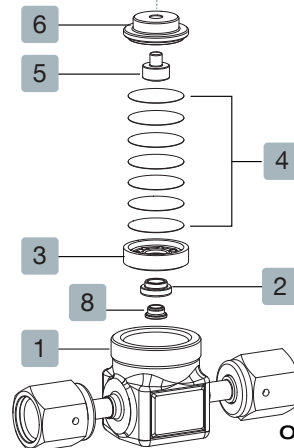
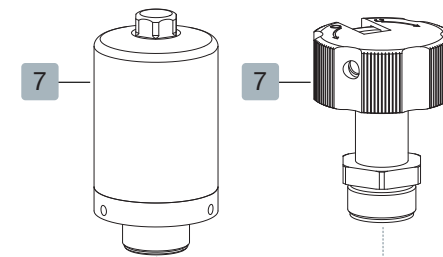
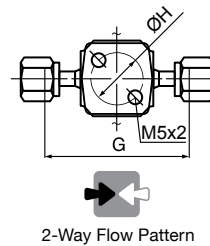
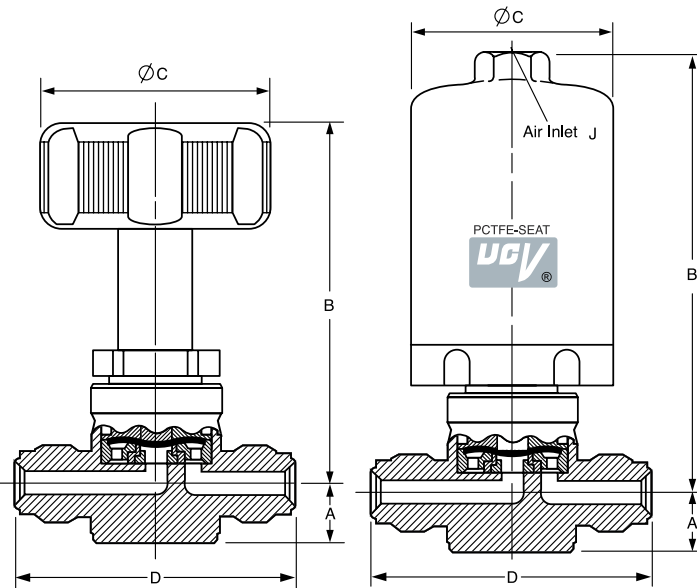
- Can be used as shutoff valves for high-pressure fluids at up to 21 MPa/3060 psi.
- A large choice of fluid-specific seat materials is available as an option.
- Electropolished surfaces

For more information, please contact one of our field representatives.



STANDARD CONFIGURATION DIMENSIONS

Part Number/ep	Size	End Connection	A	B	C	D	E	H	J
2LSS4C-BW	1/4	Short Butt Weld	11	(89)	40	44.4		25	Rc1/8
2LSS4C-FV	1/4	Swivel Female HTC®	11	(89)	40	70.6		25	Rc1/8
2LSS8C-W	1/2	Extended Butt Weld	17.5	(92.5)	40	105		28	Rc1/8
2LSS8C-BW	1/2	Short Butt Weld	17.5	(92.5)	40	55		28	Rc1/8



SPECIFICATIONS

Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/4	21MPa / 3060 psi	-10 to 40°C (PCTFE)	0.25	3X10 ⁻¹² pa•m ³ /sec Helium	3X10 ⁻¹⁰ pa•m ³ /sec Helium
1/2		-10 to 150°C (PI)			

STRUCTURE

Parts	Material
1 Body	Stainless steel, 316L Var or Vim/Var (1)
2 Seat	PCTFE/PI (Polyimide)
3 Seat Holder	Stainless steel, 316L Var or Vim/Var (1)
4 Diaphragm	Co-Cr-Ni Alloy
5 Act. Button	304 Stainless Steel
6 Act. Button Holder	Stainless Steel, ASTM 630 H900
7 Actuation Device	Aluminum
8 Seat Retainer	Stainless steel, 316L Var or Vim/Var (1)

(1) Per SEMI F20-0305

ORDERING INFORMATION:
For ordering, see page 416

EVH SERIES HP-GRADE, HIGH-PRESSURE VALVE

Metal Diaphragm Valves

High-pressure standard models from the Ultra-Clean Valve Series are made according to HP specifications. Features include a 2LH-like compact drive geometry and a highly reliable seat structure.

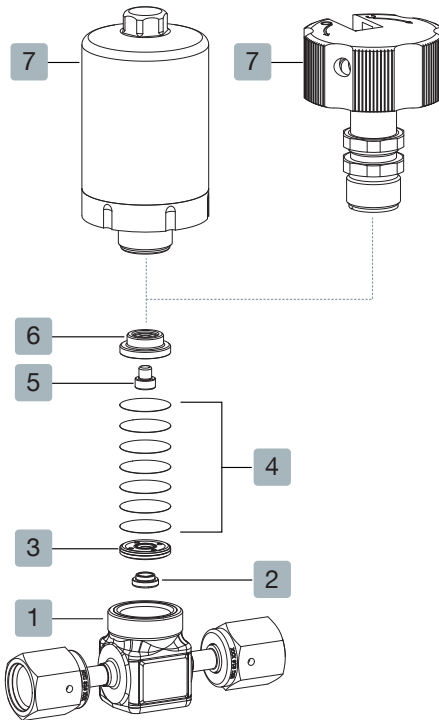
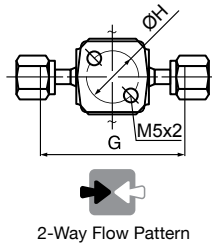
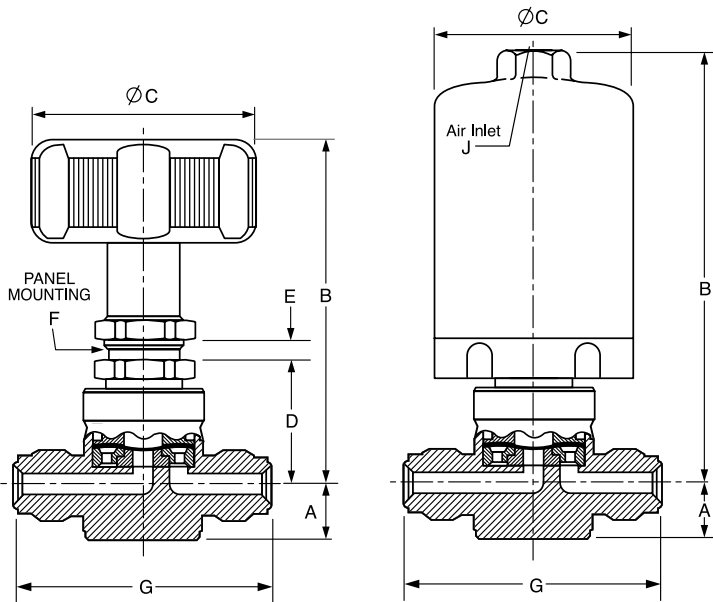
- Can be used as shutoff valves for high-pressure fluids at up to 20.6 MPa/3060 psi*.
- Compact designs for minimum footprint.
- Electropolish surfaces as an option ("-EP").

*For 3060 psi, add "-210K" to the valve description



STANDARD CONFIGURATION DIMENSIONS

Part Number/ep	Size	End Connection	A	B	C	D	E	F	G	H	J
EVH4-I	1/4	LET-LOK®	11	(68)	45	25	(2.5)	17	(63.5)	17	
EVH4-V	1/4	Male HTC®	11	(68)	45	25	(2.5)	17	52	17	
HVH4C-FV	1/4	Swivel Female HTC®	11	(85)	40				66	17	Rc1/8



SPECIFICATIONS

Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/4	16.2MPa (2300 psi) OPTION: 21MPa/3060 psi	-10 to 60°C (PCTFE) -10 to 150°C (PI)	0.1	3X10 ⁻¹² pa•m ³ /sec Helium	3X10 ⁻¹⁰ pa•m ³ /sec Helium

STRUCTURE

Parts	Material
1 Body	316L Stainless Steel (1)
2 Seat	PCTFE/PI (Polyimide)
3 Seat Holder	316L Stainless Steel
4 Diaphragm	Co-Cr-Ni Alloy
5 Act. Button	304 Stainless Steel
6 Act. Button Holder	Stainless Steel, ASTM 630 H900
7 Actuation Device	Aluminum

(1) Single melt - VOD

ORDERING INFORMATION:
For ordering, see page 416

3LD

STANDARD METAL SEAT MODEL

Metal Diaphragm Valves

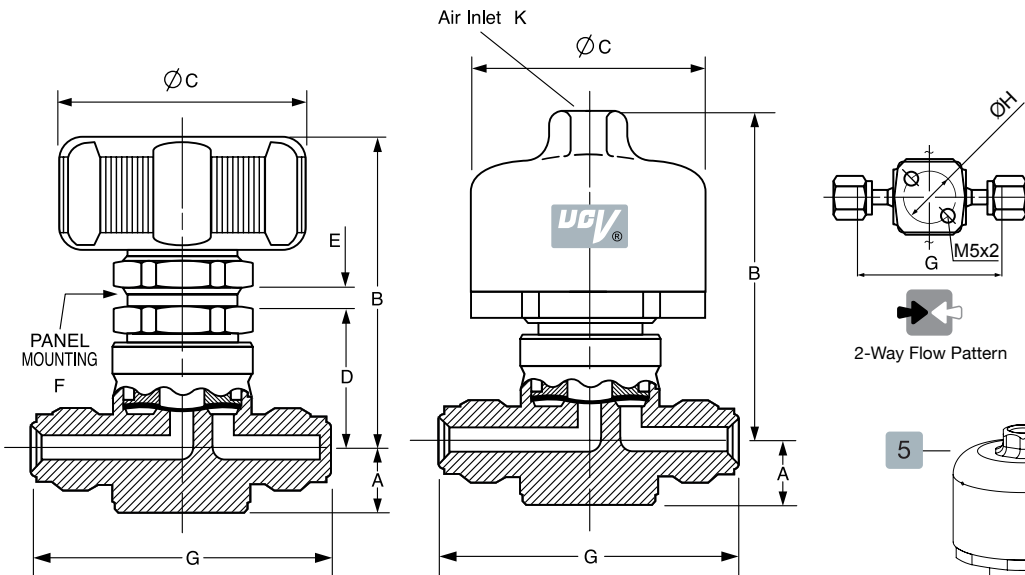
Standard models from the Ultra-Clean Valve Series are made according to UHP specifications. They are the ultimate in metallic diaphragm-operated valves with resins completely removed from their gas contact areas. Available in connection joint sizes of 1/4", 3/8" and 1/2", as a standard.

- High-speed replacement of media in a gas or liquid state.
- Extensive records of proven performance on corrosive gases (such as HCl and F2).
- Designs can be customized to meet specific needs.
- Electropolished surfaces



STANDARD CONFIGURATION DIMENSIONS

Part Number/ep	Size	End Connection	A	B	C	D	E	F	G	H	k
3LDS4R-BV	1/4	Male HTC®	11	(63)	45	29	(4)	23	58	25	
3LDS4C-W	1/4	Extended Butt Weld	11	(89)	34				89	25	Rc1/8
3LDS4C-BW	1/4	Short Butt Weld	11	(89)	34				44.4	25	Rc1/8
3LDS6R-W	3/8	Extended Butt Weld	17.5	(67.5)	45	32.5	(4)	23	105	28	
3LDS8C-FV	1/2	Swivel Female HTC®	17.5	(92.5)	40				100	28	Rc1/8
3LDS8C-W	1/2	Extended Butt Weld	17.5	(92.5)	40				105	28	Rc1/8



SPECIFICATIONS

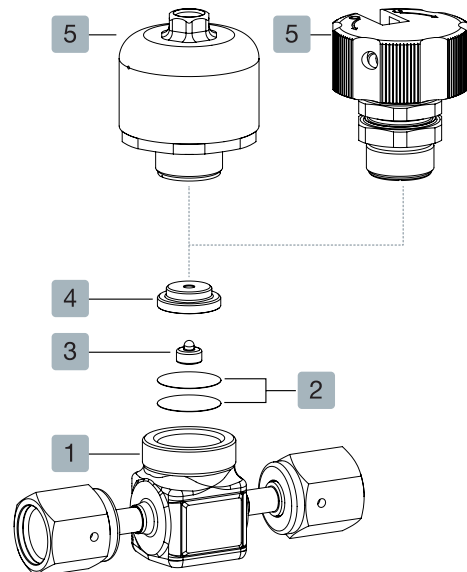
Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/4	1MPa (150 psi)	-10 to 150°C	0.3	3X10 ⁻¹²	2X10 ⁻⁸
3/8			0.7	pa•m ³ /sec Helium	pa•m ³ /sec Helium
1/2			0.7		

STRUCTURE

Parts	Material
1 Body	Stainless steel, 316L Var or Vim/Var (1)
2 Diaphragm	Co-Cr-Ni Alloy
3 Act. Botton	304 Stainless Steel
4 Act. Botton Holder	Stainless Steel, ASTM 630 H900
5 Actuation Device	Aluminum

(1) Per SEMI F20-0305

ORDERING INFORMATION:
For ordering, see page 416



3LT SERIES

HIGH-TEMPERATURE METAL SEAT

Metal Diaphragm Valves

The highest-ranking grade of high-temperature models from the Ultra-Clean Valve Series are made according to UHP specifications. It is the ultimate in metallic diaphragm-operated valves with resins completely removed from their gas-contact areas. These valves can be used at temperatures of up to 250°C.

- Best suited for use as MOCVD changeover valves.



STANDARD CONFIGURATION DIMENSIONS

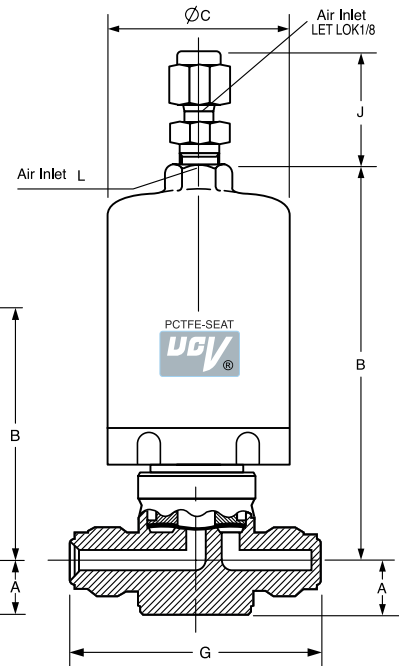
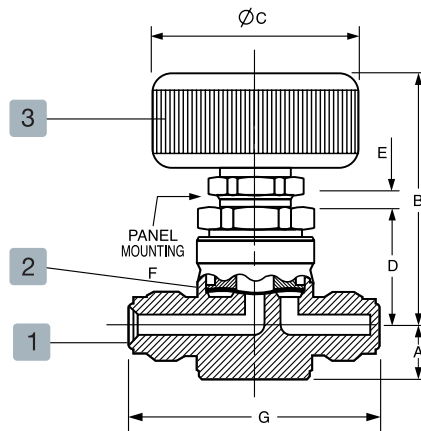
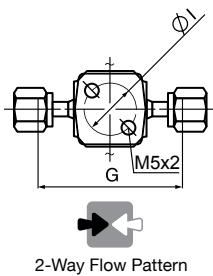
Part Number/ep	Size	End Connection	A	B	C	D	E	F	G	I	J	L
3LTS8D-BV	1/2	Male HTC®	17.5	(67.5)	45	32.5	(4)	23	76	28		
3LTS8C-W	1/2	Extended Butt Weld	17.5	(92.3)	40				105	28	29.2	Rc1/8
3LTS8C-BW	1/2	Short Butt Weld	17.5	(92.3)	40				55	28	29.2	Rc1/8

SPECIFICATIONS

Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/2	1MPa (150 psi)	-10 to 250°C	0.7	3X10 ⁻¹² pa•m ³ /sec Helium	2X10 ⁻⁶ pa•m ³ /sec Helium

STRUCTURE

	Parts	Material
1	Body	316L Stainless Steel
2	Diaphragm	Co-Cr-Ni Alloy
3	Handle/Act	Aluminum



ORDERING INFORMATION:

For ordering, see page 416

3LE SERIES

COMPACT METAL SEAT MODEL

Metal Diaphragm Valves

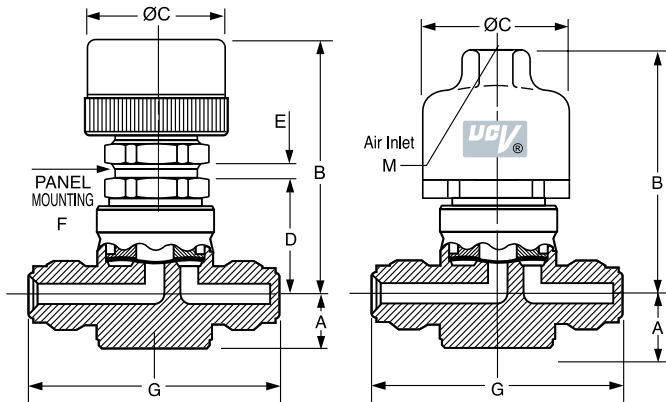
The highest-ranking grade of high-pressure-high-flow models from the Ultra-Clean Valve Series are made according to UHP specifications. It is the ultimate in metallic diaphragm-operated valves with resins completely removed from their gas-contact areas. Their minimized valve internal volumes also best recommended them for use in liquid source supply applications.

- Compact designs for minimum footprint.
- High-speed replacement of fluids in a gas or liquid state.
- Electropolished surfaces.

For details, please contact one of our field representatives.



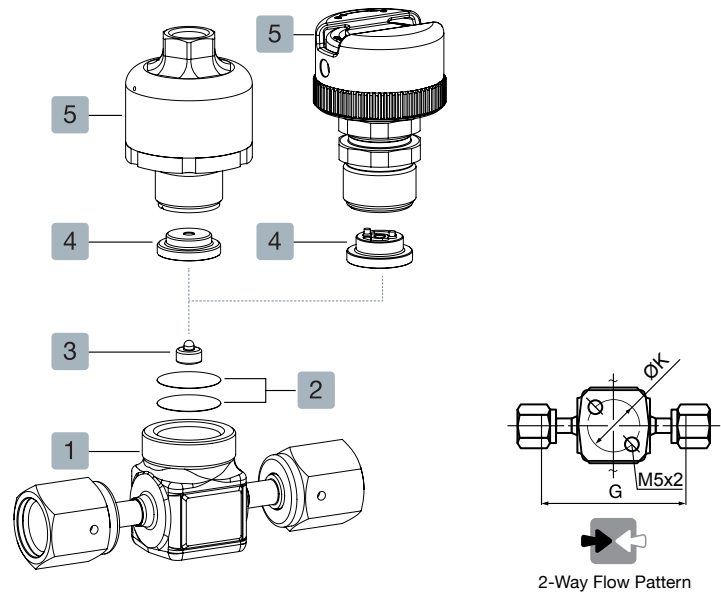
STANDARD CONFIGURATION DIMENSIONS											
Part Number/ep	Size	End Connection	A	B	C	D	E	F	G	K	M
3LES2Q-BV	1/8	Male HTC®	8	(51)	30	23	(4)	15	41	15	
3LES4Q-W	1/4	Extended ButtWeld	11	(52)	30	24.5	(4)	17	47	17	
3LES4C-BW	1/4	Short ButtWeld	11	(54)	32	24.5	(4)	17	44.4	17	Rc1/8
3LES4C-FV	1/4	Swivel Female HTC®	11	(54)	32				66	17	Rc1/8



SPECIFICATIONS					
Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/8	1MPa (150 psi)	-10 to 150°C	0.05	3X10 ⁻¹² pa•m ³ /sec Helium	1X10 ⁻⁹ pa•m ³ /sec Helium
1/4			0.1		

STRUCTURE		
Parts	Material	
1 Body	Stainless steel, 316L Var or Vim/Var ⁽¹⁾	
2 Diaphragm	Co-Cr-Ni Alloy	
3 Act. Button	304 Stainless Steel	
4 Act. Button Holder	Stainless Steel, ASTM 630 H900	
5 Actuation Device	Aluminum	

⁽¹⁾ Per SEMI F20-0305



ORDERING INFORMATION

For ordering, see page 416

3LS SERIES
HIGH-PRESSURE-HIGH-FLOW
METAL SEAT

Metal Diaphragm Valves

The highest-ranking grade of high-pressure-high-flow models from the Ultra-Clean Valve Series are made according to UHP specifications. It is the ultimate in metallic diaphragm-operated valves with resins completely removed from their gas-contact areas. With their compact designs, these valves comfortably fit into high-pressure high-flow applications.

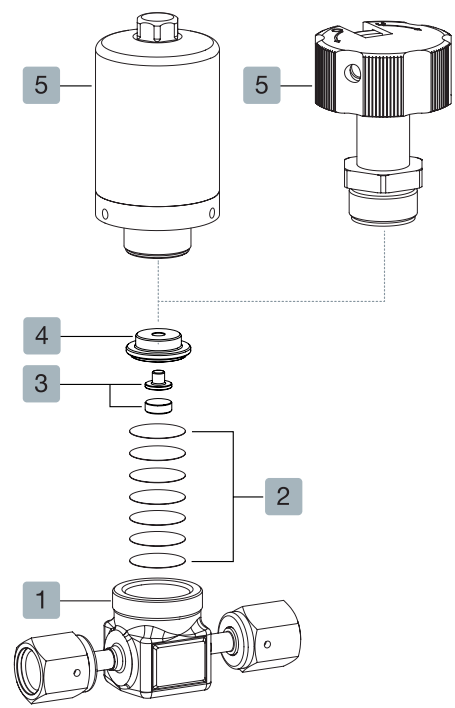
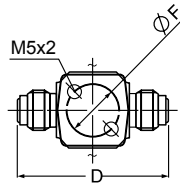
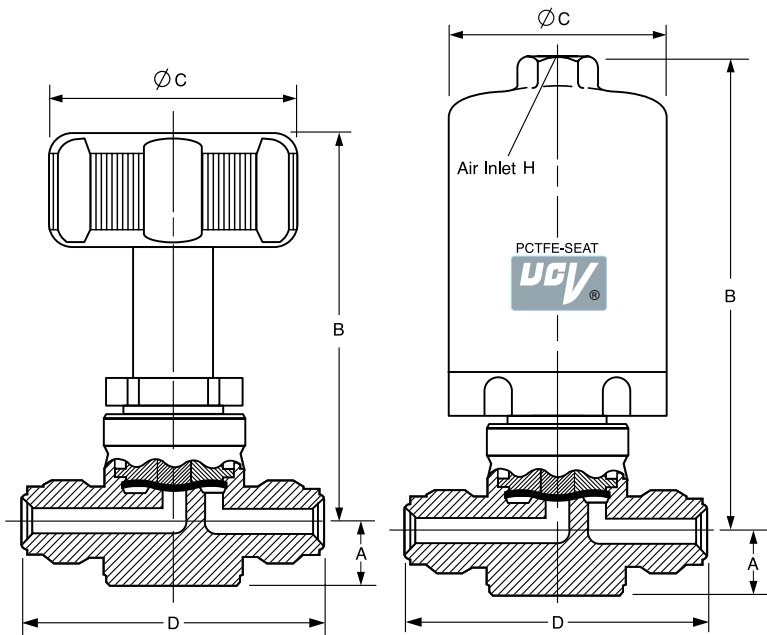
- Can be used as shutoff valves for high-pressure fluids at up to 21 MPa/3060 psi.
- Compact designs for minimum footprint.
- Extensive records of proven performance on corrosive gases (such as HCl and F2).
- Electropolished surfaces

For more information, please contact one of our field representatives.



STANDARD CONFIGURATION DIMENSIONS

Part Number/ep	Size	End Connection	A	B	C	D	F	G	H
3LSS4R-W	1/4	Extended Butt Weld	11	(71)	45	89	25	M5	
3LSS4R-BW	1/4	Butt Weld	11	(71)	45	44.4	25	M5	
3LSS4C-FV	1/4	Swivel Female HTC®	11	(89)	40	70.6	25	M5	Rc1/8
3LSS8C-W	1/2	Extended Butt Weld	17.5	(92.5)	40	105	28	M5	Rc1/8
3LSS8C-BW	1/2	Short Butt Weld	17.5	(92.5)	40	55	28	M5	Rc1/8



SPECIFICATIONS

Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/4	21MPa / 3060 psi	-10 to 150°C	0.25	3 X 10 ⁻¹² Pa m ³ /sec Helium	7 X 10 ⁻¹⁰ Pa m ³ /sec Helium
1/2				0.27	

STRUCTURE

Parts	Material
1 Body	Stainless steel, 316L Var or Vim/Var(1)
2 Diaphragm	Co-Cr-Ni Alloy
3 Act. Botton Set	304 Stainless Steel
4 Act. Botton Holder	Stainless Steel, ASTM 630 H900
5 Actuation Device	Aluminum

ORDERING INFORMATION:
 For ordering, see page 416

(1) Per SEMI F20-0305

3LH SERIES

HIGH-PRESSURE METAL SEAT

Metal Diaphragm Valves

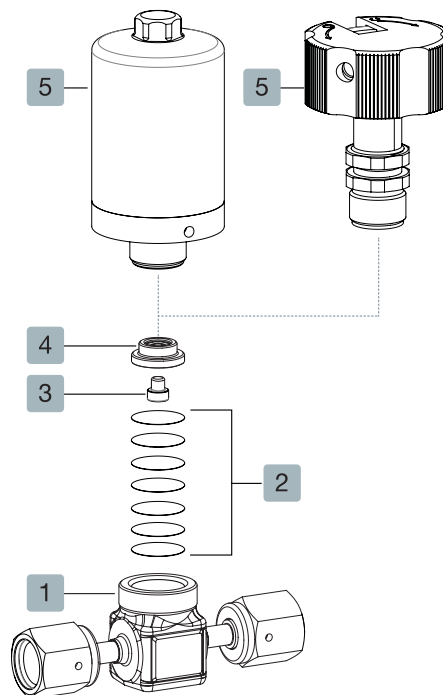
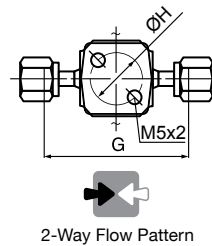
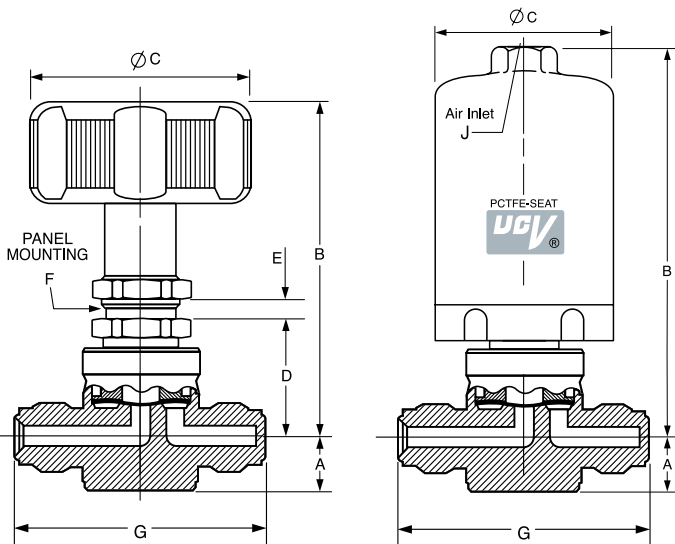
The highest-ranking grade of high-pressure-high-flow models from the Ultra-Clean Valve Series are made according to UHP specifications. It is the ultimate in metallic diaphragm-operated valves with resins completely removed from their gas-contact areas. It can be used to supply corrosive gases (such as HCl and F2) at high pressures.

- Can be used as shutoff valves for high-pressure fluids at up to 16.2 MPa/2300 psi.
 - Compact designs for minimum footprint.
 - Electropolished surfaces
 - Optionally ready for 21 MPa/3060 psi (*For 3060 psi, add "-210K" to the valve description).
- For more information, please contact one of our field representatives.



STANDARD CONFIGURATION DIMENSIONS

Part Number/ep	Size	End Connection	A	B	C	D	E	F	G	H	J
3LHS2R-BV	1/8	Male HTC®	8	(67)	43	23	(2.5)	16	41	15	
3LHS4R-W	1/4	Extended Butt Weld	11	(68)	45	25	(2.5)	17	47	17	
3LHS4R-BW	1/4	Short Butt Weld	11	(68)	45	25	(2.5)	17	44.4	17	
3LHS4C-FV	1/4	Swivel Female HTC®	11	(85)	40				66	17	Rc1/8



SPECIFICATIONS

Size	Pressure	Temp.	Cv	Leak Rates	
				Inboard	Across Seat
1/4	16.2MPa (2300 psi) OPTION: 21MPa/3060 psi	-10 to 150°C	0.1	3X10 ⁻¹² pa•m ³ /sec Helium	3X10 ⁻¹⁰ pa•m ³ /sec Helium

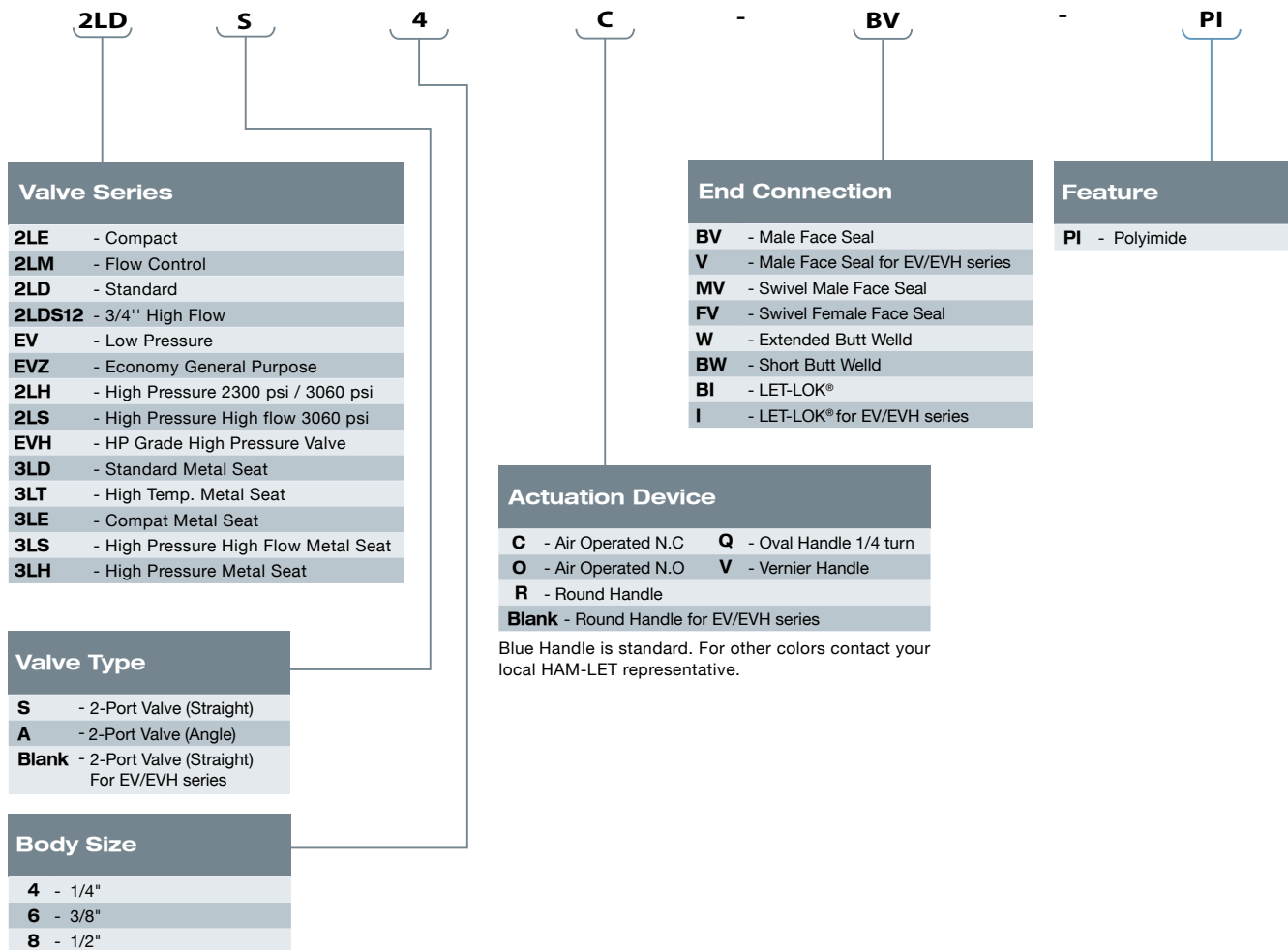
STRUCTURE

Parts	Material
1 Body	Stainless steel, 316L Var or Vim/Var(1)
2 Diaphragm	Co-Cr-Ni Alloy
3 Act. Button	304 Stainless Steel
4 Act. Button Holder	Stainless Steel, ASTM 630 H900
5 Actuation Device	Aluminum

ORDERING INFORMATION:
For ordering, see page 416

(1) Per SEMI F20-0305

ORDERING INFORMATION



- Standard seat: PCTFE.
- For valves that are made of bar stock, see Ordering Information page 425 & 428

For your convenience, port conversion of old HMJ valves to current HM series:
A = 30 | B = 35 | C = 33 | D = 31 | E = 32 | F = 34

Warning! For your safety

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.

SEAT MATERIAL SELECTION

Gas	Molecular Formula	State*	Seat Materials** Diaphragm Valve		
			PCTFE	Pi	Metal
AMMONIA	NH ₃	L.G	⊙	△	⊙
ARGON	Ar	G	⊙	⊙	⊙
ARSINE	ASH ₃	C.G	⊙	⊙	⊙
BORON TRICHLORIDE	BCl ₃	L.G	○	△	⊙
BORON TRICHLORIDE	BF ₃	C.G	○	△	⊙
CHLORINE	Cl ₂	L.G	○	X	⊙
DIBORANE	B ₂ H ₆	C.G	○	○	⊙
DICHLORO SILANE	SiH ₂ Cl ₂	L.G	○	△	⊙
DISILANE	Si ₂ H ₆	G	○	○	⊙
DI-CHLORO DI-FLUORO METHANE	CCl ₂ F ₂	L.G	⊙	△	⊙
MONO-CHLORO TRI-FLUORO METHANE	CClF ₃	L.G	⊙	△	⊙
TETRA FLUORO METHANE	CF ₄	G	⊙	⊙	⊙
TRI FLUORO METHANE	CHF ₃	L.G	⊙	⊙	⊙
HEXA-FLUORO METHANE	C ₂ F ₆	L.G	⊙	⊙	⊙
HELIUM	He	G	⊙	⊙	⊙
HYDROGEN	H ₂	G	⊙	⊙	⊙
HYDROGEN BROMIDE	HBr	C.G	△	X	⊙
HYDROGEN CHLORIDE	HCl	L.G	○	X	⊙
HYDROGEN SULFIDE	H ₂ S	L.G	○	X	⊙
NITROGEN	N ₂	G	⊙	⊙	⊙
NITROGEN TRIFLUORIDE	NF ₃	G	⊙	⊙	⊙
NITROGEN OXIDE	N ₂ O	L.G	△	○	⊙
OXIGEN	O ₂	G	⊙	⊙	⊙
PHOSPHINE	PH ₃ :PURE PH ₃ :MIX	G	○	○	⊙
SILANE	SiH ₄	G	○	○	⊙
SILICON TERACHLORID	SiCl ₄	L.G	○	△	⊙
SULFER HEXAFLORIDE	SF ₆	L.G	○	○	⊙
TUNGSTEN HEXAFLUORIDE	WF ₆	L.G	○	△	⊙

* STATE-L.G: LIQUEFIED GAS C.G: COMPRESSED GAS G:GAS

** SEAT MATERIALS - ⊙: VERY GOOD ○: GOOD △: CAUTION X: POOR

Warning! For your safety

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, Rev 04, January 2014

