



ULTRA HIGH PURITY **DIAPHRAGM VALVES** VCD Series

www.unilok.com



UNILOK 

Features

Compact designed body with minimal dead space

Body materials comply with SEMI F-20, "Specification 316LSS Materials for UHP (Ultra High Purity) Grade Semiconductor Manufacturing Applications"

Maximum flow capacity

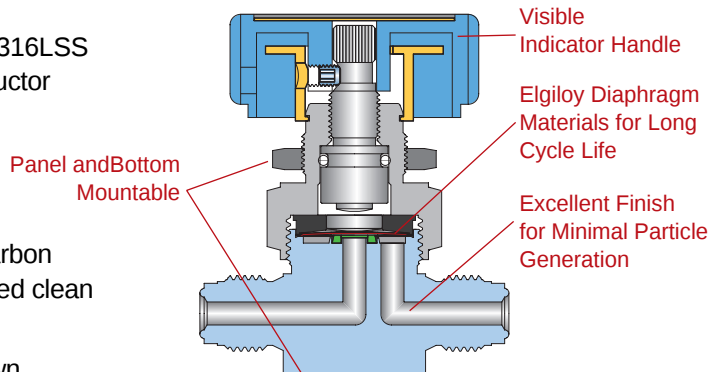
Minimal particle generation

Minimal contributions of moisture, oxygen and hydrocarbon with Uni-Lok's own special cleaning process in a certified clean room

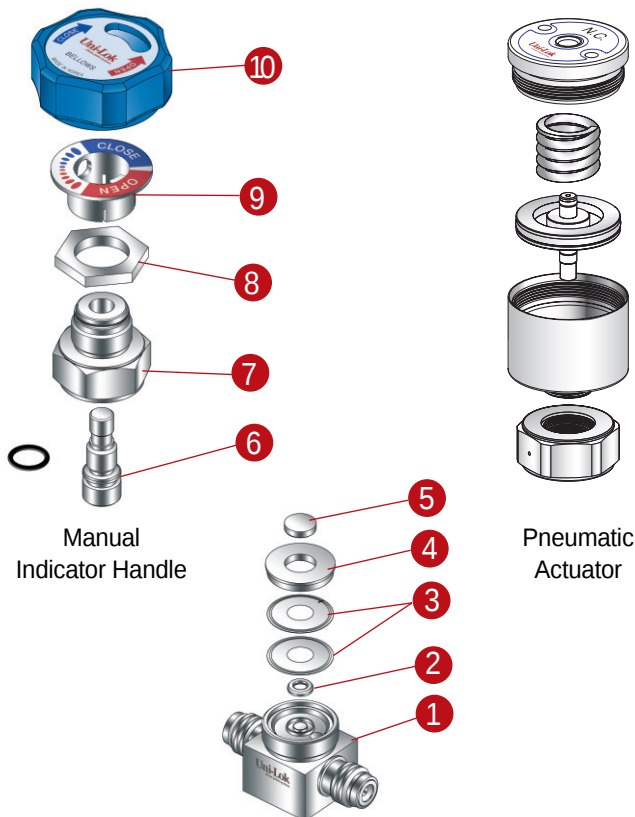
Excellent finish level of wetted areas with Uni-Lok's own electro polish process

Elgiloy® diaphragm material with strong durability as well as corrosion resistance for long cycle life

PCTFE seat material with remarkable chemical and thermal resistance



Standard Type Low Pressure Diaphragm Valves



Materials of Construction

No.	Description	Materials	
		Manual	Pneumatic
1	Body	316LSS	316LSS
2	Seat	PCTFE	PCTFE
3	Diaphragm	Elgiloy	Elgiloy
4	Bushing	316SS	316SS
5	Button	316SS	316SS
6	Stem	316SS	-
7	Bonnet	316SS	-
8	Panel Nut	316SS	-
9	Indicator	Polyester	-
10	Handle	Aluminum	-
11	Actuator	-	Aluminum

Internal Surface Finish Levels

Designator	Surface Finish(μm)	
	Average	Maximum
BA	< 0.4	< 1.6
EP	< 0.125	< 0.4

Helium Leak Test

Every VCD series valves are inboard helium leak tested to a rate of 1×10^{-9} cm³/sec at seat and all seals.

Particle Contribution Test

According to ASTM F1394-92.

Moisture Contribution Test

According to SEMA-90120397B-STD.

Cleaning

All components are precisely cleaned with 18M Ω deionized water after the passivation procedure in accordance with our own UHP cleaning process
Reference specification : SEMI E49.6.

How To Order

Uni-Lok VCD series valves are ordered by part number as shown as below.

Assembling

According to SEMI E49.6.

Packaging

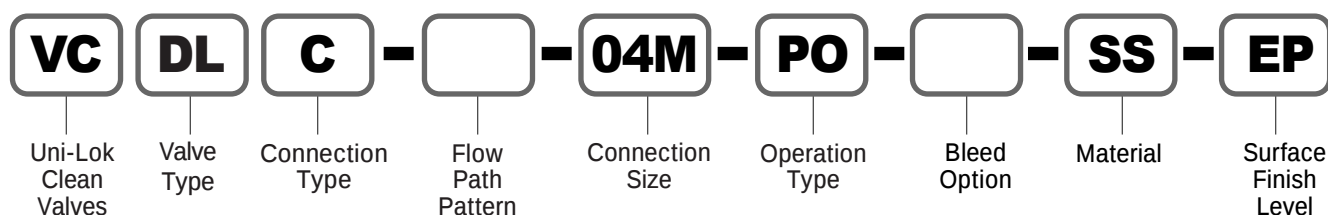
Each component is double bagged to ensure component cleanliness and to protect them from environmental contamination.
Referenced specification : SEMI E49.1.

Important Notification

Proper installation, materials compatibility, operation and maintenance of these valves are the responsibility of the user. The total system design must be taken into consideration to ensure optimal performance and safety.

Overall process of testing, cleaning, assembling and packaging for every VCD series valves are performed in a certified clean room.

Example : The following part number, **VCDLC-04M-PO-SS-EP** is designated for Low Pressure Diaphragm Valve, both 1/4" Male UCR, Pneumatic Normal Open Operation, 316LSS, EP.



Valve Type	
DL	Standard Low Pressure
DH	Standard High Pressure
DS	Shut Off
DF	Forged Body
DBL	Block Low Pressure
DBH	Block High Pressure

Connection Type	
U	Uni-Lok Tube Fitting
C-*M	Male UCR
C-*F	Female UCR
C-*MR	Rotable Male UCR
WB-*T	Butt Weld -Tube
WB-*P	Butt Weld - Pipe

UCR - Metal Face Seal

Connection Size					
Fractional(Inch) Tube O.D. Designation					
Tube O.D.	inch	1/4	3/8	1/2	3/4
	mm	6.35	9.52	12.70	19.05
Designator		04	06	08	12

UCR (Metal Face Seal) Size Designator			
UCR Size		1/4	1/2
Designator		04M/04F	08M/08F

Operation Type	
None	Manual Indicator Handle
MD	Manual Directional Handle
PO	Pneumatic - Normal Open
PC	Pneumatic - Normal Close
POC	Block Type Pneumatic 1-N.O. 2-N.C.
PCO	Block Type Pneumatic 1-N.C. 2-N.O.

Bleed Option	
None	No Bleed
3	Constant Bleed $\varnothing$ 0.3
6	Constant Bleed $\varnothing$ 0.6

Material	
DM	316LSS - Double Melting
SM	316LSS - Single Melting
SS	316LSS

Surface Finish Level	
BA	BA
EP	EP - Electro Polished

Flow Path Patter Designator
See the details in page 9.

VCDL series

(Standard Type Low Pressure Diaphragm Valve - Manual Operation)

Specification

Size	1/4"	3/8", 1/2"	3/4"
Orifice Size	4.3	6.5	6.5
Cv Value	0.3	0.7	0.7
Max. Working Pressure	17 bar (250 psig)		
Max. Working Temperature	-10~80°C (-23~176°F)		
Internal Leakage Allowance - He (Holding Time - Min 30 sec)	$\leq 1 \times 10^{-9}$ atm.cc/s		
External Leakage Allowance - He (Holding Time - Min 1 min)	$\leq 1 \times 10^{-9}$ atm.cc/s		



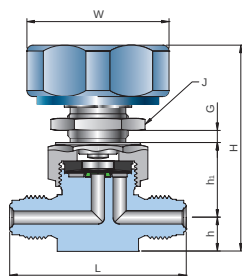
Handle Position



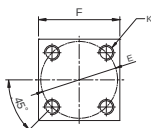
Open



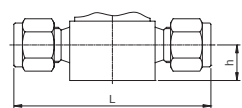
Close



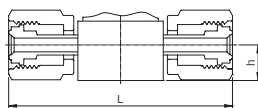
Male UCR



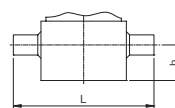
Bottom
Mounting



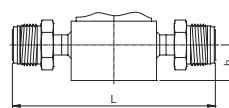
Uni-Lok Tube Fitting



Female UCR



Tube Butt Weld



Rotatable Male UCR

Ordering Information & Dimensions

Part Number		End Connection		Dimensions (mm)									
		Inlet	Outlet	L	h	h1	H	F	E	K	W(Ø)	G	J(Ø)
VCDL	U-04T-	1/4" Uni-Lok		62.0	11.2	24.7	68.6	26.9	25.4	M5	47.0	5.0	21.0
	U-06T-	3/8" Uni-Lok		74.8	16.0	31.8	80.5	37.0	28.0				
	U-08T-	1/2" Uni-Lok		80.2	16.0	31.8	80.5	37.0	28.0				
	U-12T-	3/4" Uni-Lok		108.0	22.0	36.3	91.0	37.0	28.0				
	C-04M-	1/4" Male UCR		58.4	11.2	24.7	68.6	26.9	25.4				
	C-08M-	1/2" Male UCR		73.6	16.0	31.8	80.5	37.0	28.0				
	C-12M-	3/4" Male UCR		88.0	22.0	36.3	91.0	37.0	28.0				
	C-04MR-	1/4" Rotatable Male UCR		100.0	11.2	24.7	68.6	26.9	25.4				
	C-04F-	1/4" Female UCR		70.5	11.2	24.7	68.6	26.9	25.4				
	C-08F-	1/2" Female UCR		83.0	16.0	31.8	80.5	37.0	28.0				
	WB-04T-	1/4" Tube Butt Weld		44.2	11.2	24.7	68.6	26.9	25.4				
	WB-06T-	3/8" Tube Butt Weld		73.6	16.0	31.8	80.5	37.0	28.0				
	WB-08T-	1/2" Tube Butt Weld		73.6	16.0	31.8	80.5	37.0	28.0				
	WB-12T-	3/4" Tube Butt Weld		88.0	22.0	36.3	91.0	37.0	28.0				

Dimensions are for reference only and are subject to change without prior notice.

VCDL series

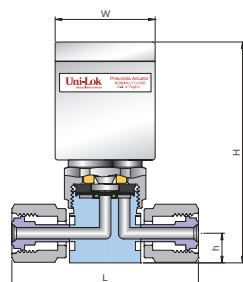
(Standard Type Low Pressure Diaphragm Valve - Pneumatic Actuating Operation)

Specification

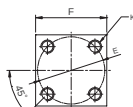
Size	1/4"	3/8", 1/2"
Orifice Size	4.3	6.5
Cv Value	0.3	0.7
Max. Working Pressure	17 bar (250 psig)	
Max. Working Temperature	-10~80°C (-23~176°F)	
Actuator Pressure Rating	4~7 bar (58~101 psig)	
Internal Leakage Allowance - He (Holding Time - Min 30 sec)	$\leq 1 \times 10^{-9}$ atm.cc/s	
External Leakage Allowance - He (Holding Time - Min 1 min)	$\leq 1 \times 10^{-9}$ atm.cc/s	



Actuator Configuration



Female UCR



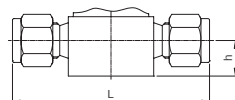
Bottom Mounting



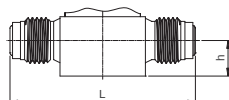
Normal Open



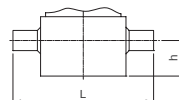
Normal Close



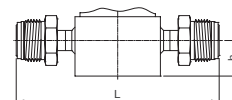
Uni-Lok Tube Fitting



Male UCR



Tube Butt Weld



Rotatable Male UCR

Ordering Information & Dimensions

Part Number		End Connection		Dimensions (mm)						
		Inlet	Outlet	L	h	H	W(Ø)	F	E	K
VCDL	U-04T-	1/4" Uni-Lok		62.0	11.2	83.5	37.8	26.9	25.4	M5
	U-06T-	3/8" Uni-Lok		74.8	16.0	94.4	53.0	37.0	28.0	
	U-08T-	1/2" Uni-Lok		80.2	16.0	94.4	53.0	37.0	28.0	
	C-04M-	1/4" Male UCR		58.4	11.2	83.5	37.8	26.9	25.4	
	C-08M-	1/2" Male UCR		73.6	16.0	94.4	53.0	37.0	28.0	
	C-04F-	1/4" Female UCR		70.5	11.2	83.5	37.8	26.9	25.4	
	C-08F-	1/2" Female UCR		83.0	16.0	94.4	53.0	37.0	28.0	
	WB-04T-	1/4" Tube Butt Weld		44.2	11.2	83.5	37.8	26.9	25.4	
	WB-06T-	3/8" Tube Butt Weld		73.6	16.0	94.4	53.0	37.0	28.0	
	WB-08T-	1/2" Tube Butt Weld		73.6	16.0	94.4	53.0	37.0	28.0	

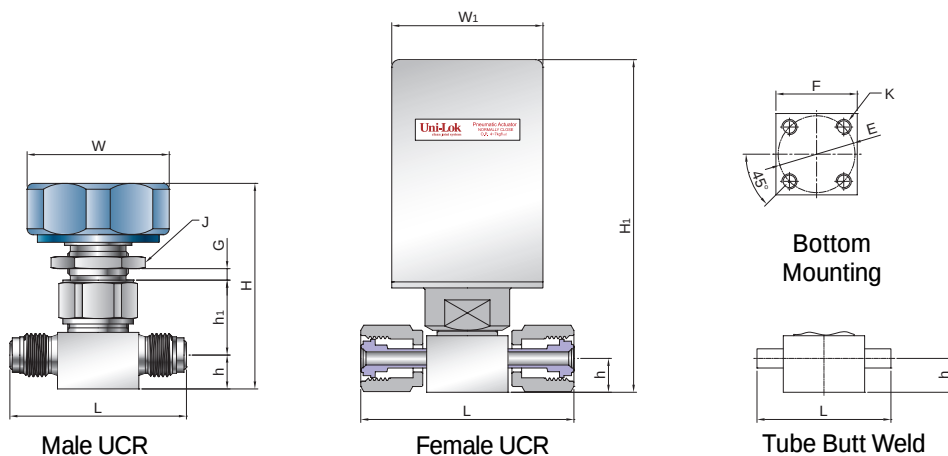
Dimensions are for reference only and are subject to change without prior notice.

VCDH series

(Standard Type High Pressure Diaphragm Valve
- Manual Operation & Pneumatic Actuating Operation)

Specification

Size	1/4"
Orifice Size	2.5
Cv Value	0.1
Max. Working Pressure	210 bar (3045 psig)
Max. Working Temperature	-10~80°C (-23~176°F)
Actuator Pressure Rating	5~7 bar (73~101 psig)
Internal Leakage Allowance - He (Holding Time - Min 30 sec)	$\leq 1 \times 10^{-9}$ atm.cc/s
External Leakage Allowance - He (Holding Time - Min 1 min)	$\leq 1 \times 10^{-9}$ atm.cc/s



Ordering Information & Dimensions

Part Number	End Connection		Dimensions (mm)											
	Inlet	Outlet	L	h	h1	H	H1	F	E	K	W(Ø)	W1(Ø)	G	J(Ø)
VCDH C-04M-	1/4" Male UCR		58.4	11.2	24.7	68.6	110.0	29.6	25.4	M5	47.0	50.0	5.0	21.0
VCDH C-04F-	1/4" Female UCR		70.5											
VCDH WB-04T-	1/4" Tube Butt Weld		44.3											

Handle Position and Actuator Configuration

Both are the same as VCDL series.

Dimensions are for reference only and are subject to change without prior notice.

VCDS series

(Shut Off Type Low Pressure Diaphragm Valve - Manual Operation)

Specification

Size	1/4"	3/8", 1/2"
Orifice Size	4.3	6.5
Cv Value	0.3	0.7
Max. Working Pressure	17 bar (250 psig)	
Max. Working Temperature	-10~80°C (-23~176°F)	
Internal Leakage Allowance - He (Holding Time - Min 30 sec)	$\leq 1 \times 10^{-9}$ atm.cc/s	
External Leakage Allowance - He (Holding Time - Min 1 min)	$\leq 1 \times 10^{-9}$ atm.cc/s	

Handle Position

Quick and quarter turn handle actuation



Open



Close

Colored Handle

Colored handle are available for VCDS series valves. To order, add handle color designator next to connection size designator.



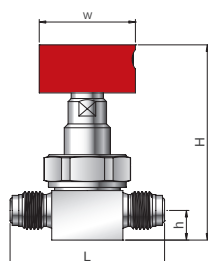
-MDR Red



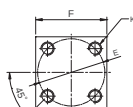
-MDS Blue



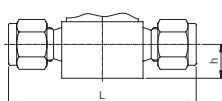
-MDB Black



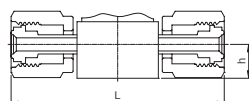
Male UCR



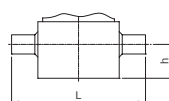
Bottom Mounting



Uni-Lok Tube Fitting



Female UCR



Tube Butt Weld

Ordering Information & Dimensions

Part Number		End Connection		Dimensions (mm)						
		Inlet	Outlet	L	h	H	F	E	W(Ø)	K
VCDS	U-04T-	1/4" Uni-Lok		62.0	11.2	75.2	26.9	25.4	36.9	M5
	U-06T-	3/8" Uni-Lok		74.8	16.0	103.0	37.0	28.0	50.0	
	U-08T-	1/2" Uni-Lok		80.2	16.0	103.0	37.0	28.0	50.0	
	C-04M-	1/4" Male UCR		58.4	11.2	75.2	26.9	25.4	36.9	
	C-08M-	1/2" Male UCR		73.6	16.0	103.0	37.0	28.0	50.0	
	C-04F-	1/4" Female UCR		70.5	11.2	75.2	26.9	25.4	36.9	
	C-08F-	1/2" Female UCR		83.0	16.0	103.0	37.0	28.0	50.0	
	WB-04T-	1/4" Tube Butt Weld		44.2	11.2	75.2	26.9	25.4	36.9	
	WB-06T-	3/8" Tube Butt Weld		73.6	16.0	103.0	37.0	28.0	50.0	
	WB-08T-	1/2" Tube Butt Weld		73.6	16.0	103.0	37.0	28.0	50.0	

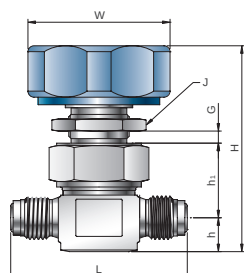
Dimensions are for reference only and are subject to change without prior notice.

VCDF series

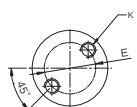
(Forged Body Low Pressure Diaphragm Valve - Manual Operation)

Specification

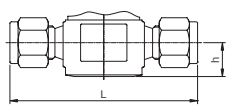
Size	1/4"	3/8", 1/2"	3/4"
Orifice Size	4.3	6.5	6.5
Cv Value	0.3	0.7	0.7
Max. Working Pressure	17 bar (250 psig)		
Max. Working Temperature	-10~80°C (-23~176°F)		
Internal Leakage Allowance - He (Holding Time - Min 30 sec)	$\leq 1 \times 10^{-9}$ atm.cc/s		
External Leakage Allowance - He (Holding Time - Min 1 min)	$\leq 1 \times 10^{-9}$ atm.cc/s		



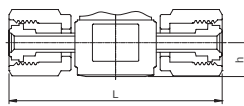
Male UCR



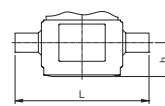
Bottom Mounting



Uni-Lok Tube Fitting



Female UCR



Tube Butt Weld

Ordering Information & Dimensions

Part Number		End Connection		Dimensions (mm)								
		Inlet	Outlet	L	h	h1	H	E	K	W(Ø)	G	J(Ø)
VCDF	U-04T-	1/4" Uni-Lok		62.0	11.2	24.7	68.6	17.0	M5	47.0	5.0	21.0
	U-06T-	3/8" Uni-Lok		74.8	16.0	31.8	80.5	28.0				
	U-08T-	1/2" Uni-Lok		80.2	16.0	31.8	80.5	28.0				
	U-12T-	3/4" Uni-Lok		108.0	22.0	36.3	91.0	28.0				
	C-04M-	1/4" Male UCR		58.4	11.2	24.7	68.6	17.0				
	C-08M-	1/2" Male UCR		73.6	16.0	31.8	80.5	28.0				
	C-12M-	3/4" Male UCR		88.0	22.0	36.3	91.0	28.0				
	C-04F-	1/4" Female UCR		70.5	11.2	24.7	68.6	17.0				
	C-08F-	1/2" Female UCR		83.0	16.0	31.8	80.5	28.0				
	WB-04T-	1/4" Tube Butt Weld		44.2	11.2	24.7	68.6	17.0				
	WB-06T-	3/8" Tube Butt Weld		73.6	16.0	31.8	80.5	28.0				
	WB-08T-	1/2" Tube Butt Weld		73.6	16.0	31.8	80.5	28.0				
	WB-12T-	3/4" Tube Butt Weld		88.0	22.0	36.3	91.0	28.0				

Handle Position

Handle position is the same as VCDL series.

Dimensions are for reference only and are subject to change without prior notice.

VCDBL series

(Block Type Low Pressure Diaphragm Valve
- Manual Operation & Pneumatic Actuating Operation)

Specification

Size	1/4"	3/8", 1/2"
Orifice Size	4.3	6.5
Cv Value	0.3	0.7
Max. Working Pressure	17 bar (250 psig)	
Max. Working Temperature	-10~80°C (-23~176°F)	
Actuator Pressure Rating	4~7 bar (58~101 psig)	
Internal Leakage Allowance - He (Holding Time - Min 30 sec)	$\leq 1 \times 10^{-9}$ atm.cc/s	
External Leakage Allowance - He (Holding Time - Min 1 min)	$\leq 1 \times 10^{-9}$ atm.cc/s	

Manual Operation

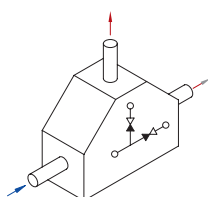


Pneumatic Actuating Operation

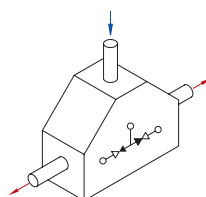


Flow Path Patterns

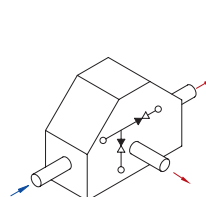
Uni-Lok VCDBL series valves have various flow paths. To order, add flow path designator next to connection size designator.



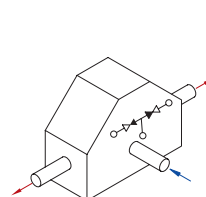
FP1A



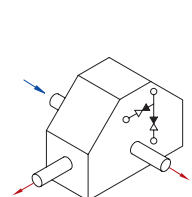
FP1B



FP2A



FP2B



FP3

Handle Position



Open



Close

Actuator Configuration



Normal Open

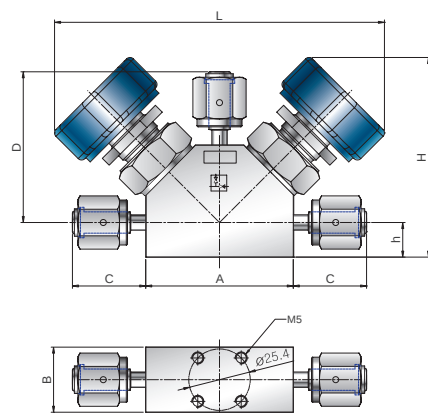


Normal Close



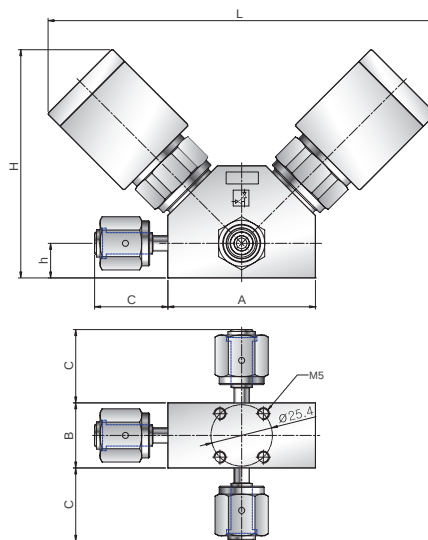
Dimensions are for reference only and are subject to change without prior notice.

Manual Operation

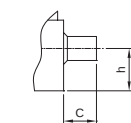


FP1A

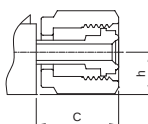
Pneumatic Actuating Operation



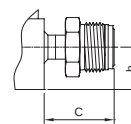
FP3



Tube Butt Weld



Female UCR



Rotatable Male UCR

Ordering Information & Dimensions

Manual Operation

Part Number				End Connection		Dimensions (mm)						
				Inlet	Outlet	A	B	C	D	h	H	L
VCDBL	C-	FP1A-	04MR-	1/4" Rotatable Male UCR		61.0	26.9	30.3	62.3	14.3	84.4	140.0
	C-		04F-	1/4" Female UCR								
	WB-		04T-	1/4" Tube Butt Weld								

Pneumatic Actuating Operation

Part Number				End Connection		Dimensions (mm)						
				Inlet	Outlet	A	B	C	D	h	H	L
VCDBL	C-	FP3-	04MR-	1/4" Rotatable Male UCR		61.0	26.9	30.3	62.3	14.3	94.3	160.0
	C-		04F-	1/4" Female UCR								
	WB-		04T-	1/4" Tube Butt Weld								

Dimensions are for reference only and are subject to change without prior notice.

VCDBH series

(Block Type High Pressure Diaphragm Valve
- Manual Operation & Pneumatic Actuating Operation)

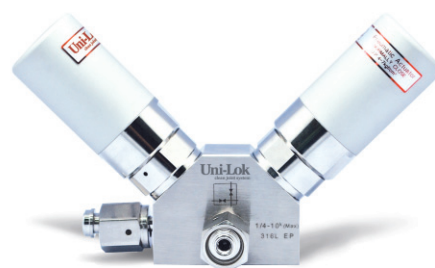
Specification

Size	1/4"
Orifice Size	2.5
Cv Value	0.1
Max. Working Pressure	210 bar (3045 psig)
Max. Working Temperature	-10~80°C (-23~176°F)
Actuator Pressure Rating	5~7 bar (73~101 psig)
Internal Leakage Allowance - He (Holding Time - Min 30 sec)	$\leq 1 \times 10^{-9}$ atm.cc/s
External Leakage Allowance - He (Holding Time - Min 1 min)	$\leq 1 \times 10^{-9}$ atm.cc/s

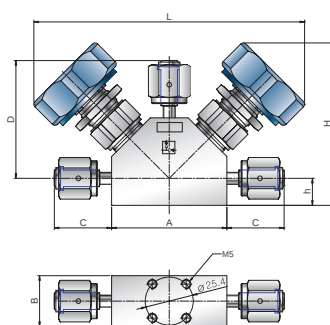
Manual Operation



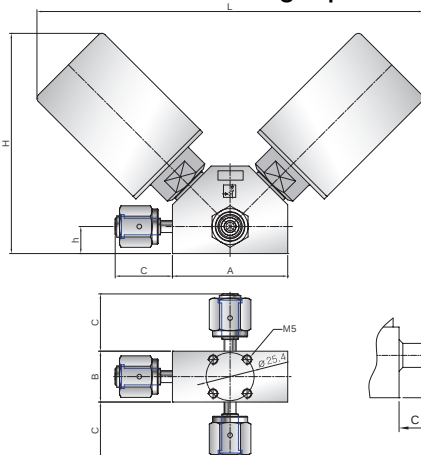
Pneumatic Actuating Operation



Manual Operation



Pneumatic Actuating Operation



Tube Butt Weld

Female UCR

Rotatable Male UCR

Ordering Information & Dimensions

Manual Operation

Part Number				End Connection		Dimensions (mm)						
				Inlet	Outlet	A	B	C	D	h	H	L
VCDBH	C-	FP1A-	04MR-	1/4" Rotatable Male UCR		61.0	26.9	30.3	62.3	14.3	84.4	140.0
	C-		04F-	1/4" Female UCR								
	WB-		04T-	1/4" Tube Butt Weld								

Pneumatic Actuating Operation

Part Number				End Connection		Dimensions (mm)						
				Inlet	Outlet	A	B	C	D	h	H	L
VCDBH	C-	FP3-	04MR-	1/4" Rotatable Male UCR		61.0	26.9	30.3	62.3	14.3	116.5	204.4
	C-		04F-	1/4" Female UCR								
	WB-		04T-	1/4" Tube Butt Weld								

Dimensions are for reference only and are subject to change without prior notice.



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