

Catalog No. H - 112BV  
Jan. 2019

# One-Piece Ball Valves

112 & 112S Series



- Pressure up to 3000psig (207bar)
- Temperature from 65°F to 300°F (-54°C to 149°C)
- Sizes form 1/8" to 3/4" (3mm to 18mm)
- Positive leak tight shut-off
- Straight & Angle pattern & 3-Way & 4-Way Pattern
- 316 Stainless Steel & Brass & Alloy 400

**HY-LOK CORPORATION**

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# One-Piece Ball Valves

## Features

### 112 Series

#### Handle with Arrow

- indicates flow direction
- allows quick operation to open and close
- is available in aluminum handle

#### Panel Mounting Nut

- allow easy installation

#### PTFE Bushing

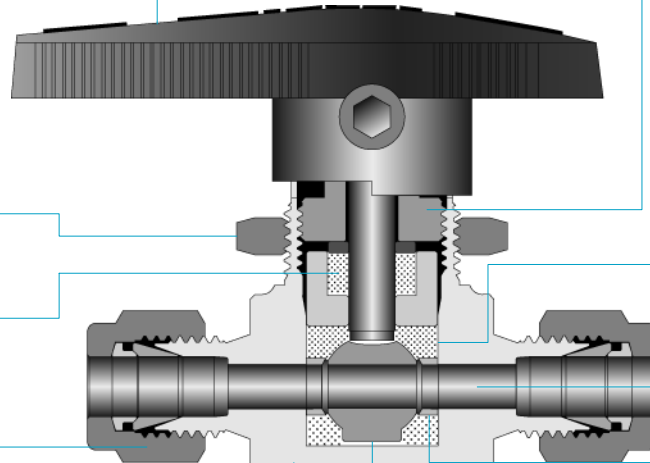
- is supported by top and bottom glands

#### Variety of End Connections

- include hy-lok tube fittings
- male/female NPT threads
- male/female ISO threads

#### Forged Body

- is available in straight and angle
- is available in 3-way and 4-way



#### Packing Bolt

- allows easy packing adjustment with valve in-line

#### Two-piece Capsule Seat

- virtually allow no dead volume
- uniformly forced to form tight seals against ball and body cavity
- available in PTFE

#### Orifice

- is optimized design for minimum pressure drop

#### Metal Supports

- prevent cold flow of PTFE into orifice

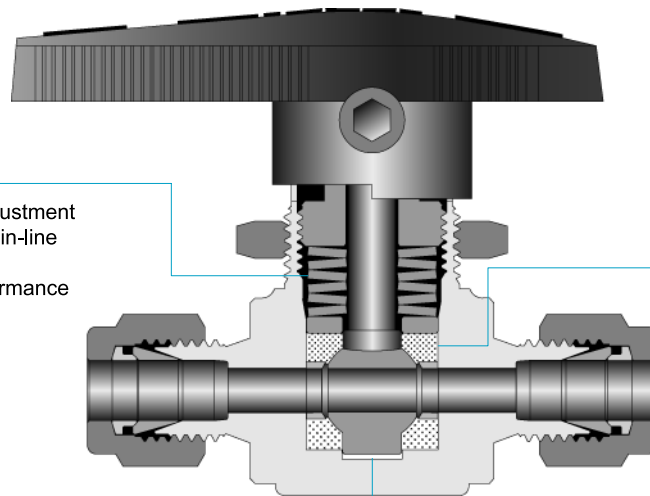
#### Integral Ball-Stem

- is machined from one piece
- is best suited to encapsulate ball packing

### 112S Series

#### Live-loaded Disc Spring

- reduces need for packing adjustment
- allows adjustment with valve in-line
- compensates for wear
- improves thermal cycle performance



#### One-piece Single encapsulated Seat

- virtually allow no dead volume
- are uniformly forced to form tight seals against ball and body cavity
- reduces potential leak points
- is available in PFA or TFM

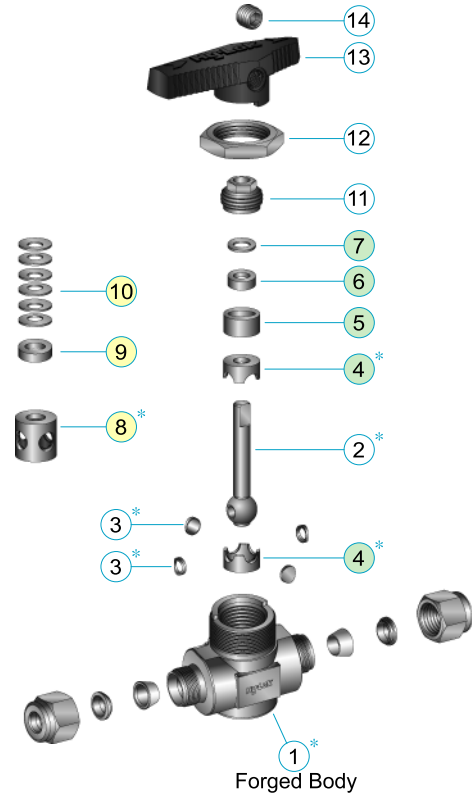
#### Integral Ball-Stem

- machined from one piece
- is best suited to encapsulate ball packing

## Materials of Construction

Item	Description	Grade / ASTM Specification		
		SS316	Brass	Alloy 400
1	Body*	SS316 / A182	C377 / B283	N04400 / B164
2	Ball Stem*	SS316 / A276 or A479		N04400 / B164
3	Support*	PTFE Coated Stainless Steel		
4	Upper&Lower Seat*	PTFE		
5	Lower Gland	SS316 / A276 or A479		
6	Packing*	PTFE		
7	Upper Gland	SS316 / A276 or A479		
8	Single Seat*	TFM or PFA		
9	Gland	SS316 / A276 or A479		
10	Disc Spring	SS177 / A693		
11	Packing Bolt	SS316 / A276 or A479		
12	Panel Nut	SS316 / A276 or A479		
13	Handle	Black Nylon		
14	Handle bolt	Stainless Steel		

**Note :** \* \* marked are wetted parts.  
 Item No.4~7 are only available on 112 Series.  
 Item No.8~10 are only available on 112S Series.  
 112S Series are only available on SS316 material.



## Technical Data

Valve Series	112			112S	
Valve Size	B1V(Straight,Angle,3Way) B2V(Angle,3Way) B3V,B4V(Straight)	B2V (Straight)	B3V,B4V (Angle,3Way)	B1SV(Straight,Angle,3Way) B2SV(Angle,3Way)	B2SV (Straight)
Seat Material	PTFE [50°F(10°C) to 150°F(65°C)]			PFA [-65°F(-54°C) to 300°F(149°C)]	
Temperature °F(°C)	Working Pressure psig (bar)				
-65(-54) to 50(10)	-	-	-	2500 (172)	3000 (206)
50(10) to 150(65)	2500 (172)	3000 (206)	1500 (103)	2500 (172)	3000 (206)
200(93)	-	-	-	2500 (172)	2800 (193)
250(121)	-	-	-	2500 (172)	2650 (182)
300(149)	-	-	-	2500 (172)	2500 (172)

To determine kPa, multiply psig by 6.89 and bar by 0.0689  
 When valves with Hy-Lok Fitting end connections are connected to tubing, the working pressure of tubing must be the considered in the caculation of total system working pressure

## Testing

- Each valve is tested with nitrogen @ 1000 psig (69bar) to max. leak rate of 0.1SCCM.
- Optional tests are available upon request.

## Packing Adjustment

- Valves are factory adjusted for 1000psig service at 70°F (21°C).
- For services at higher pressure, the packing must be readjusted. This can be done with the valve in-line. Untighten the hex key to remove the handle. Tighten the packing bolt clockwise with the increment of a **quarter of a quarter** turn (22.5°) until leaktight seal is obtained. And then reassemble.
- Exposure of valves to varying temperature can affect the initial packing load. You may need check leak and readjust packing bolt.

## For 3-way (Switching Valves)

### ⚠ Attention

- 1) Check the flow direction
- 2) Do not use quarter turn the handle for block (Only guarantee the 180° turn the handle)

## Handle

- Standard : Black Nylon handle
- Optional : Blue, Green, Red, Yellow Nylon handle  
Aluminum bar handle

## Sour Gas Service

- This service is provided to meet NACE Standard MR-0175 & MR-0103.

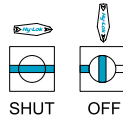
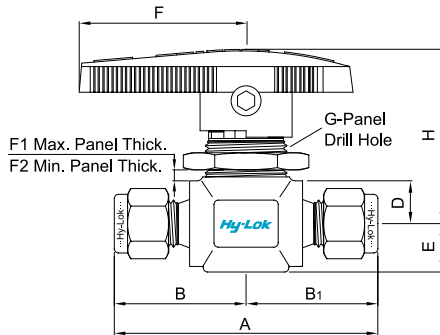
## Cleaning and Packaging

- All metering valves are cleaned and packaged in accordance with Hy-Lok standard cleaning and packaging.
- A special cleaning and packaging are available as an option.

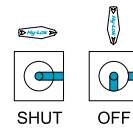
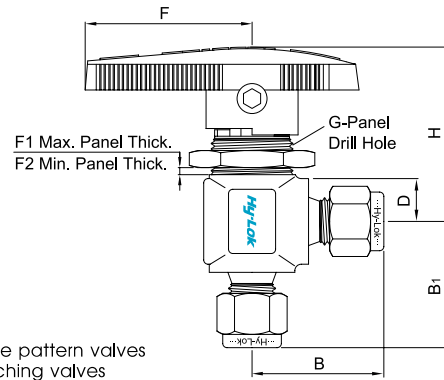
# One-Piece Ball Valves

## 2 - way (Shut - Off Valve)

### Straight Pattern



### Angle Pattern



For the dimension B & B1 of angle pattern valves see the dimension of 3-way switching valves

### Table of Dimensions

Basic Part No.	Orifice		CV	End Connection		Dimensions (mm)																			
	mm	inch		Inlet & Outlet	A	B	B1	D	E	F	F1	F2	G	H	W										
B1(S)VH - 1T	1.3	0.052	0.1	1/16 Hy-Lok	42.6	21.3	21.3	9.5	8.8	28.0	5.5	2.0	15.0	34.0	19.0										
B1(S)VH - 3M	2.4	0.093	0.2	3mm Hy-Lok	50.8	25.4	25.4	9.5	8.8	28.0	5.5	2.0	15.0	34.0	19.0										
B1(S)VH - 2T			0.2	1/8 Hy-Lok																					
B1(S)VF - 2N	3.2	0.125	0.5	1/8 Female NPT	41.2	20.6	20.6	9.5	8.8	28.0	5.5	2.0	15.0	34.0	19.0										
B1(S)VH - 6M			0.6	6mm Hy-Lok	55.4	27.7	27.7																		
B1(S)VH - 4T			0.6	1/4 Hy-Lok																					
B2(S)VF - 2N			1.2	1/8 Female NPT	50.8	25.4	25.4																		
B2(S)VF - 4N	4.8	0.187	0.9	1/4 Female NPT	52.4	26.2	26.2	11.3	10.0	39.0	6.0	2.5	20.0	41.2	21.0										
B2(S)VF - 4R			0.9	1/4 ISO Female Tapered																					
B2(S)VM - 4N			1.2	1/4 Male NPT	50.8	25.4	25.4																		
B2(S)VMH - 4N4T			1.6	1/4 Male NPT   1/4 Hy-Lok	55.6	25.4	30.2																		
B2(S)VH - 6M			2.4	6mm Hy-Lok	60.4	30.2	30.2																		
B2(S)VH - 4T			2.4	1/4 Hy-Lok																					
B2(S)VH - 8M			1.5	8mm Hy-Lok	62.0	31.0	31.0																		
B2(S)VH - 6T			1.5	3/8 Hy-Lok	65.0	32.5	32.5																		
B3VF - 4N			7.1	0.281	3.0	1/4 Female NPT	63.6									31.8	31.8	17.5	14.3	51.0	9.0	3.0	28.0	52.8	33.0
B3VF - 6N					2.6	3/8 Female NPT																			
B3VF - 6R	2.6	3/8 ISO Female Tapered																							
B3VH - 6T	6.0	3/8 Hy-Lok			77.8	38.9		38.9																	
B3VH - 10M			6.0	10mm Hy-Lok																					
B4VF - 8N	10.3	0.406	6.3	1/2 Female NPT	79.2	39.6	39.6	22.0	17.5	77.0	10.0	3.0	39.0	67.0	41.0										
B4VF - 8R			6.3	1/2 ISO Female Tapered																					
B4VH - 12M			12.0	12mm Hy-Lok												100.0	50.0	50.0							
B4VH - 8T			12.0	1/2 Hy-Lok																					
B4VH - 12T			6.4	3/4 Hy-Lok																					

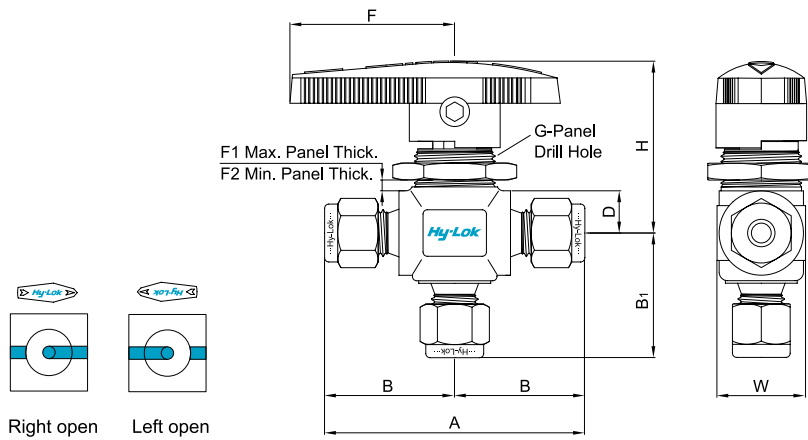
All dimensions are in millimeters. Dimensions shown with Hy-Lok nuts in finger-tight position, where applicable

### Flow Rate

Pressure Drop to Atmosphere ( $\Delta p$ ) in psi	Cv															
	0.1	0.2	0.5	0.6	0.9	1.2	1.5	1.6	2.4	2.6	3.0	6.0	6.3	6.4	12.0	
Air SCFM @70°F(21°C)	10	1.1	2.7	6.9	8.3	12.0	17.0	21.0	22.0	33.0	36.0	41.5	83.0	87.2	88.6	166.0
	50	3.0	7.6	19.1	23.0	34.0	46.0	57.0	61.0	92.0	99.5	115.0	230.0	241.0	245.0	459.0
	100	5.3	14.0	33.9	40.7	61.0	81.0	100.0	110.0	160.0	176.0	203.0	407.0	427.0	434.0	814.0
Water US GPM @70°F(21°C)	10	0.3	0.6	1.6	1.9	2.8	3.7	4.7	5.0	7.5	8.2	9.5	19.0	19.9	20.2	37.9
	50	0.7	1.4	3.5	4.2	6.3	8.4	11.0	11.0	17.0	18.4	21.2	42.3	44.5	45.3	84.9
	100	1.0	2.0	5.0	6.0	9.0	12.0	15.0	16.0	24.0	26.0	30.0	60.0	63.0	64.0	120.0

The Cv is for the straight pattern valves. Cvs of angle pattern valves are the same as those of 3-way valves

### 3 - way (Switching Valve)



### Table of Dimensions

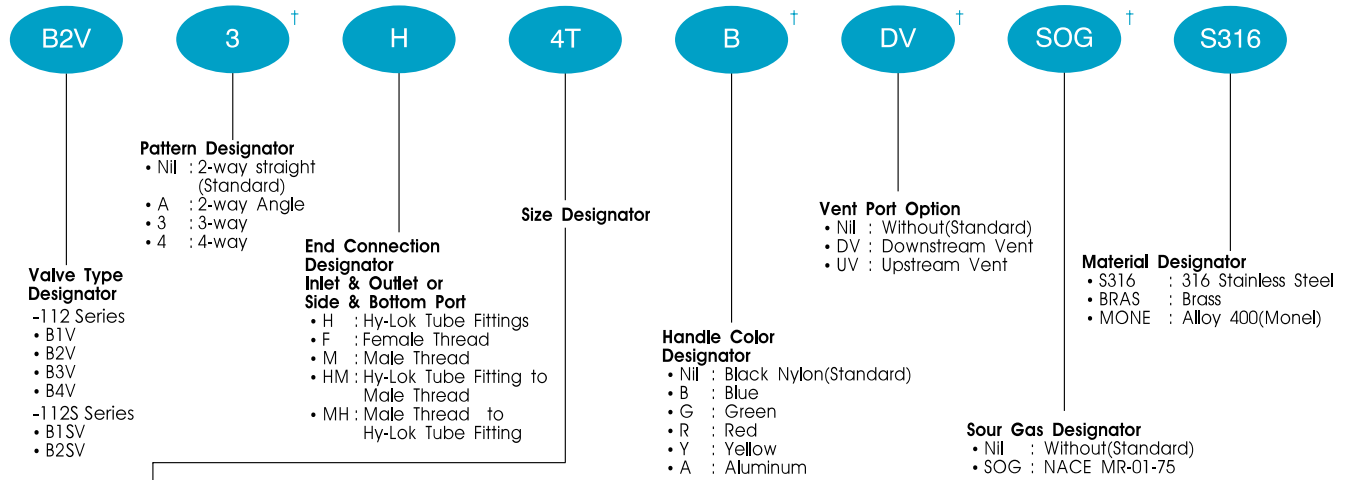
Basic Part No.	Orifice		Cv	End Connection		Dimensions (mm)									
	mm	inch		Side port	Bottom port	A	B	B1	D	F	F1	F2	G	H	W
B1(S)V3H -1T	1.3	0.052	0.08	1/16 Hy-Lok		42.6	21.3	20.6	8.8	28.0	5.5	2.0	15.0	34.0	19.0
B1(S)V3H -3M	2.4	0.093	0.15	3mm Hy-Lok		50.8	25.4	24.6	8.8	28.0	5.5	2.0	15.0	34.0	19.0
B1(S)V3H -2T			0.15	1/8 Hy-Lok											
B1(S)V3F -2N	3.2	0.125	0.30	1/8 Female NPT		41.2	20.6	20.6	8.8	28.0	5.5	2.0	15.0	34.0	19.0
B1(S)V3H -6M			0.35	6mm Hy-Lok		55.4	27.7	26.9							
B1(S)V3H -4T			0.35	1/4 Hy-Lok											
B2(S)V3F -4N	4.8	0.187	0.75	1/4 Female NPT		52.4	26.2	26.2	10.0	39.0	6.0	2.5	20.0	41.2	21.0
B2(S)V3F -4R			0.75	1/4 ISO Female Tapered											
B2(S)V3H -6M			0.90	6mm Hy-Lok		60.4	30.2	29.5							
B2(S)V3H -4T			0.90	1/4 Hy-Lok											
B2(S)V3HM -4T4N			0.80	1/4 Hy-Lok	1/4 Male NPT	26.2									
B2(S)V3H -8M	0.80	8mm Hy-Lok		62.0	31.0	30.2									
B3V3F -4N	7.1	0.281	1.7	1/4 Female NPT		63.6	31.8	31.8	14.5	51.0	9.0	3.0	28.0	52.8	30.0
B3V3F -6N			1.5	3/8 Female NPT											
B3V3F -6R			1.5	3/8 ISO Female Tapered											
B3V3H -6T			2.0	3/8 Hy-Lok											
B3V3H -10M	2.0	10mm Hy-Lok		73.2	36.6	35.8									
B4V3F -8N	10.3	0.406	3.5	1/2 Female NPT		79.2	39.6	39.6	17.5	77.0	10.0	3.0	39.0	67.0	41.0
B4V3F -8R			3.5	1/2 ISO Female Tapered											
B4V3H -12M			4.6	12mm Hy-Lok											
B4V3H -8T			4.6	1/2 Hy-Lok											
B4V3H -12T			3.8	3/4 Hy-Lok											

All dimensions are in millimeters. Dimensions shown with Hy-Lok nuts in finger-tight position, where applicable

### Flow Rate

Pressure Drop to Atmosphere ( $\Delta p$ ) in psi		Cv												
		0.08	0.15	0.30	0.35	0.75	0.8	0.9	1.5	1.7	2.0	3.5	3.8	4.6
Air SCFM @70°F(21°C)	10	0.9	2.0	4.2	4.8	10.0	11.0	12.0	20.8	23.5	27.7	48.4	52.6	63.7
	50	2.4	5.7	11.5	13.4	29.0	31.0	34.0	57.4	65.0	76.5	134.0	145.0	176.0
	100	4.3	10.1	20.3	23.7	51.0	54.0	61.0	102.0	115.0	136.0	237.0	258.0	312.0
Water US GPM @70°F(21°C)	10	0.3	0.4	0.9	1.1	2.3	2.5	2.8	4.7	5.4	6.3	11.1	12.0	14.5
	50	0.6	1.0	2.1	2.5	5.3	5.6	6.3	10.6	12.0	14.1	24.7	26.9	32.5
	100	0.8	1.5	3.0	3.5	7.5	8.0	9.0	15.0	17.0	20.0	35.0	38.0	46.0

# Ordering Information



• NPT (ISO/BSP)

Thread(in.)	1/8	1/4	3/8	1/2	3/4
Designator	2N(R)	4N(R)	6N(R)	8N(R)	12N(R)

• Tube

Fractional Tube	O.D(in.)	1/16	1/8	1/4	3/8	1/2	5/8	3/4
	Designator	1T	2T	4T	6T	8T	10T	12T
Metric Tube	O.D(mm)	3	6	8	10	12	16	20
	Designator	3M	6M	8M	10M	12M	16M	20M

**Note †** : No designator is required for standard, black nylon handle, e.g.B2VH-4T-S316.

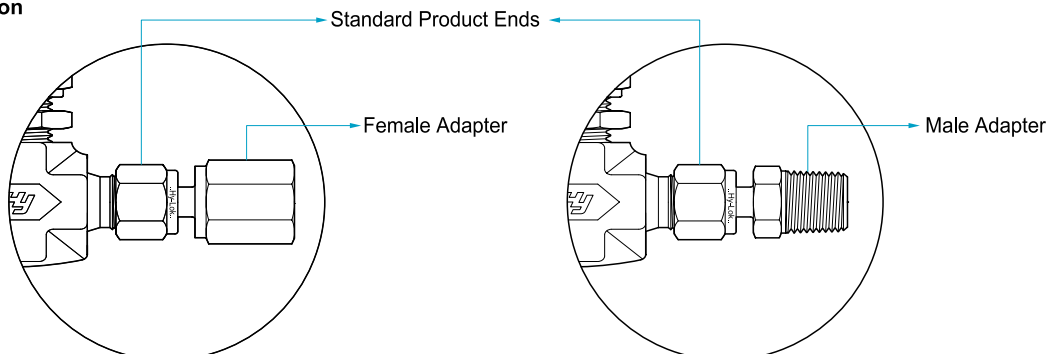
## SAFETY in VALVE SELECTION

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.

## Use of Non-Standard Products

For non-standard not shown in dimension table, it can be used by assembling Hy-Lok tube fittings to standard products. This use of way is easily available to the construction of system, especially it is more reasonable in aspects of delivery and purchasing costs. For the more information and types of connector, please refer to the Hy-Lok Tube Fitting Catalog.

### Example of Connection



**Note** :This figure is only for reference, please refer to Hy-Lok tube fittings catalog for varios connection.