



**Type-21/21A Ball Valve**

### Standard Features (Sizes 1/2" – 6")

- Pressure rated up to 230psi (PVC, CPVC, PVDF)
- Double O-ring seals on stem for added protection
- Full bore, sizes 1/2" – 2"
- Full vacuum rated, all sizes
- Blocks in two directions, upstream and downstream, leaving full pressure on the opposite end of the valve
- Integrally molded ISO mounting pad for both manual and actuated operations
- Integrally molded base pad to mount valves securely or panel mounting
- PTFE seats with elastomeric backing cushions ensure bubble-tight shut-off and a low fixed torque, while at the same time compensating for wear
- True union design for easier installation or repairs without expanding the pipe system
- Built-in spanner wrench on the handle for valve disassembly and assembly
- Two sets of end connectors (socket and threaded included with all PVC and CPVC valves in sizes 1/2"– 2"
- CPVC threaded end connectors on sizes 1/2" – 1" come with stainless steel reinforcing rings
- New PTFE seat design – Facilitates easier field maintenance if required
- Tapered O-ring groove – Helps to keep the end connector O-rings on the valve body during installation
- Body flats – Flats have been added to either side of the valve body where a wrench can be applied to prevent the valve body from turning when the union nuts are tightened

### Options

- Pneumatic and electric actuators and accessories
- Stem extensions
- 2" square operating nut or "T" nut
- Locking and/or spring return handles
- Limit switches
- Vented ball

### Specifications

**Sizes:** 1/2" – 6"  
**Models:** PVC & CPVC: Socket, Threaded and Flanged (ANSI)  
 PP & PVDF: IPS and Metric (DIN)  
 Socket, Threaded, Butt and Flanged (ANSI)  
**Bodies:** PVC, CPVC, PP and PVDF  
**Seats:** PTFE backed with EPDM or FKM  
**Seals:** EPDM or FKM or AFLAS®†

**Sizes 1/2" - 4" PVC/EPDM/FKM Models**

**NSF-61 Certified**

† Trademark of Asahi Glass Co., Ltd.

### Parts List (Sizes 1/2" – 2")

PARTS			
NO.	DESCRIPTION	PCS.	MATERIAL
1	Body	1	PVC, CPVC, PP, PVDF
2	Ball	1	PVC, CPVC, PP, PVDF
3	Carrier	1	PVC, CPVC, PP, PVDF
4	End Connector	2	PVC, CPVC, PP, PVDF
5	Union Nut	2	PVC, CPVC, PP, PVDF
6	Stem	1	PVC, CPVC, PP, PVDF
7	Seat	2	PTFE
8	O-Ring (A)	2	EPDM, FKM, Others
9	O-Ring (B)	1	EPDM, FKM, Others
10	O-Ring (C)	2	EPDM, FKM, Others
11	O-Ring (D)	1	EPDM, FKM, Others
12	O-Ring (E)	1	EPDM, FKM, Others
13	Stop Ring*	2	PVDF
14	Handle	1	ABS
4a	Ring**	2	304 Stainless Steel

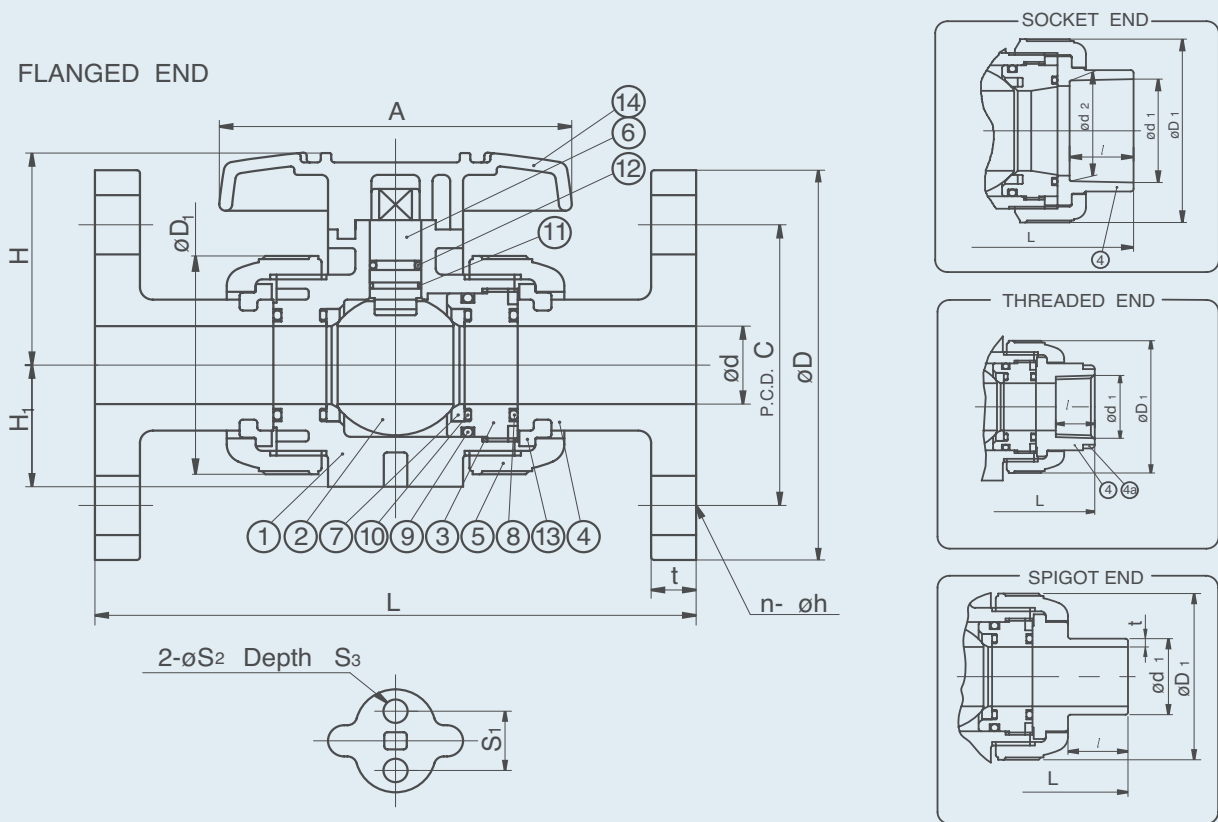
\* Used for flanged end.

\*\* Used for CPVC body, threaded end, 1/2"–1".



# Type-21/21A

# Ball Valves



**Dimensions (Sizes 1/2" – 2") (in.)**

NOMINAL SIZE			FLANGED						SOCKET										
			ANSI CLASS 150					PVC, CPVC				PP, PVDF (DIN)				PP, PVDF (IPS)			
								ASTM SCH 80				DIN 16962							
INCHES	mm	d	D	C	n	h	L	t	d1	d2	/	L	d1	d2	/	L	d1	/	L
1/2	15	0.59	3.50	2.38	4	0.62	5.63	0.47	0.848	0.836	0.875	4.45	0.768	0.760	0.57	3.90	0.83	0.87	4.45
3/4	20	0.79	3.88	2.75	4	0.62	6.77	0.55	1.058	1.046	1.000	5.08	0.965	0.957	0.63	4.45	1.03	1.00	5.08
1	25	0.98	4.25	3.12	4	0.62	7.36	0.55	1.325	1.310	1.125	5.75	1.240	1.232	0.71	4.84	1.30	1.13	5.75
1-1/4	32	1.26	4.62	3.50	4	0.62	7.48	0.63	1.670	1.655	1.250	6.46	1.553	1.543	0.81	5.47	1.65	1.25	6.46
1-1/2	40	1.57	5.00	3.88	4	0.62	8.35	0.63	1.912	1.894	1.375	7.24	1.947	1.937	0.93	5.87	1.89	1.37	7.24
2	50	2.01	6.00	4.75	4	0.75	9.21	0.63	2.387	2.369	1.500	8.23	2.461	2.445	1.08	6.93	2.36	1.50	8.23

NOMINAL SIZE		THREADED							SPIGOT (BUTT END)								
		d1	/	L	D1	H	H1	A	PP,PVDF				S1	S2	S3		
									DIN 3442		PP	PVDF				L	
									d1	/	t	t					
INCHES	mm																
1/2	15	1/2 - 14 NPT	0.59	4.02	1.89	2.03	1.14	3.62	0.787	0.728	0.098	0.075	4.882	0.75	0.29	0.43	
3/4	20	3/4 - 14 NPT	0.67	4.72	2.36	2.34	1.38	3.94	0.984	0.866	0.106	0.075	5.669	0.75	0.29	0.43	
1	25	1 - 11-1/2 NPT	0.79	5.16	2.76	2.68	1.54	4.33	1.260	0.886	0.118	0.094	6.063	0.75	0.29	0.43	
1-1/4	32	1-1/4 - 11-1/2 NPT	0.87	5.91	3.23	3.17	1.85	4.76	1.575	1.024	0.146	0.094	6.850	1.18	0.35	0.59	
1-1/2	40	1-1/2 - 11-1/2 NPT	0.98	6.42	3.94	3.50	2.17	5.16	1.968	1.260	0.181	0.118	7.638	1.18	0.35	0.59	
2	50	2 - 11-1/2 NPT	1.10	7.76	4.96	4.04	2.60	6.26	2.480	1.417	0.228	0.118	8.819	1.18	0.35	0.59	

**Note:** The shape and appearance of assembly differ a little with nominal size compared to this drawing.

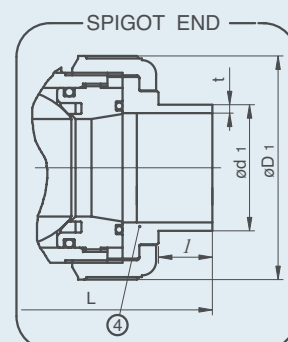
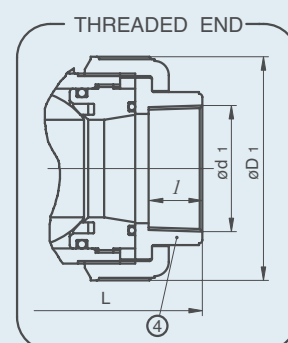
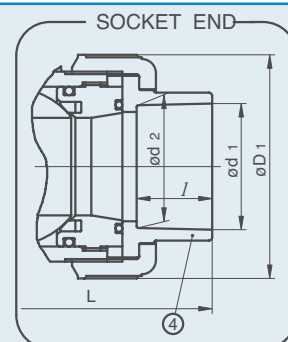
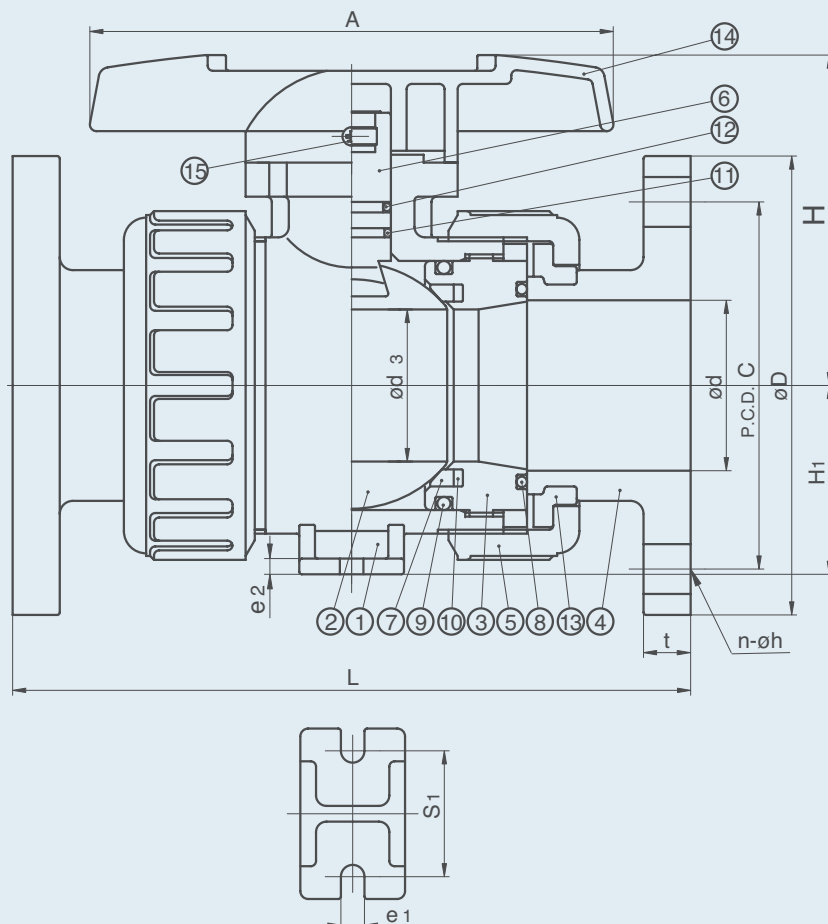
# Type-21/21A

# Ball Valves

FLANGED END

PARTS (Different Numbers from 1/2"-2")			
NO.	Description	PCS	MATERIAL
10	Cushion	2	EPDM, FKM, Others
15	Screw	1	304 Stainless Steel

NOTE: Quantity on Nos. 3 and 9 (see p. 6) is 2.



**Dimensions (Sizes 2-1/2" - 4") (in.)** For 6" size consult factory.

NOMINAL SIZE			FLANGED								SOCKET												
			ANSI CLASS 150								PVC, CPVC				PP, PVDF (DIN)					PP, PVDF (IPS)			
							L				ASTM SCH 80				DIN 16962			PP	PVDF				PP
INCHES	mm	d	D	C	n	h	PVC CPVC	PP	PVDF	t	d1	d2	/	L	d1	d2	/	L	L	d1	/	L	L
2-1/2	65	2.56	7.0	5.5	4	0.75	10.20	10.12	10.08	0.71	2.889	2.868	1.750	9.45	2.923	2.911	1.22	8.07	8.03	2.88	1.752	9.37	9.33
3	80	3.07	7.5	6.0	4	0.75	12.05	12.07	11.89	0.71	3.516	3.492	1.875	11.14	3.512	3.498	1.40	9.92	9.80	3.48	1.874	11.10	10.28
4	100	3.94	9.0	7.5	8	0.75	14.72	14.72	14.53	0.71	4.518	4.491	2.000	13.89	4.293	4.278	1.63	12.28	12.09	4.48	2.252	14.37	14.13

NOMINAL SIZE		THREADED										SPIGOT (BUTT END)								
				L								PP,PVDF								
				PVC CPVC	PP	PVDF						DIN 3442		PP	PVDF	PP	PVDF			
												d1	/							
INCHES	mm	d1	/				d3	D1	H	H1	A	d1	/	t	t	L	L	e1	e2	S1
2-1/2	65	2-1/2 - 8NPT	1.26	8.46	8.39	8.35	2.28	5,24	4.96	2.83	7.87	2.953	1.496	0.272	0.142	9.648	9.606	0.35	0.24	1.89
3	80	3 - 8NPT	1.38	10.43	10.39	10.28	2.70	5.98	5.51	3.35	9.45	3.543	1.496	0.323	0.169	11.654	11.535	0.43	0.28	2.17
4	100	4 - 8NPT	1.77	14.25	14.25	14.06	3.54	8.27	7.01	4.33	11.81	4.331	1.752	0.394	0.209	13.978	13.779	0.43	0.31	2.56

Note: The shape and appearance of assembly differ a little with nominal size compared to this drawing.

# Type-21/21A

# Ball Valves

## Pressure vs. Temperature (psi, water, non-shock)

NOMINAL SIZE		PVC				CPVC						PP				PVDF				
		30° F 70° F	71° F 105° F	106° F 120° F	121° F 140° F	30° F 70° F	71° F 105° F	106° F 120° F	121° F 140° F	141° F 175° F	176° F 195° F	- 5° F 85° F	86° F 120° F	121° F 140° F	141° F 175° F	- 5° F 70° F	71° F 105° F	106° F 140° F	141° F 175° F	176° F 210° F
INCHES	mm																			
1/2-2	15-50	230	170	150	30	230	170	150	120	75	55	150	110	90	55	230	185	150	115	85
2-1/2	65	230	170	150	NA	230	170	150	120	75	55	150	95	70	40	230	185	150	115	85
3	80	230	170	150	NA	230	170	150	85	55	40	150	95	70	40	230	185	150	100	70
4-6	100-150	150	150	150	NA	150	150	150	85	55	40	150	95	70	40	150	150	150	100	70

## Sample Specification

All Type-21/21A ball valves, sizes 1/2" to 4", shall be of true union design with two-way blocking capability. All O-rings shall be EPDM or FKM with PTFE seats. PTFE seats shall have elastomeric backing cushion of the same material as the valve seals. Stem shall have double O-rings and be of blowout-proof design. The valve handle shall double as carrier removal and/or tightening tool. ISO mounting pad shall be integrally molded to valve body for actuation. PVC conforming to ASTM D1784 Cell Classification 12454A, CPVC conforming to ASTM D1784 Cell Classification 23567-A, PP conforming to ASTM D4101 Cell Classification PPO210B67272 and PVDF conforming to ASTM D3222 Cell Classification Type II. The ball valves, except PP, shall have a pressure rating of 230psi for sizes 1/2" to 3" and 150psi for 4" (150psi for PP, all sizes) at 70° F. Type-21 ball valves must carry a two year guarantee, as manufactured by Asahi/America, Inc.

## Cv Values

NOMINAL SIZE		Cv
INCHES	mm	
1/2	15	14
3/4	20	29
1	25	47
1-1/4	32	72
1-1/2	40	155
2	50	190
2-1/2	65	365
3	80	410
4	100	680

## Weight (lbs.)

NOMINAL SIZE		SOCKET	
INCHES	mm	THREADED	FLANGED
1/2	15	0.44	1.10
3/4	20	0.66	1.54
1	25	1.1	2.70
1-1/4	32	1.54	3.30
1-1/2	40	2.64	4.40
2	50	4.4	8.15
2-1/2	65	6.17	8.80
3	80	9.7	13.00
4	100	24.00	26.67

## Caution

- Never remove valve from pipeline under pressure.
- Always wear protective gloves and goggles.
- Watch out for trapped fluid in valve. It is safe to close valve before removing it from the pipeline.

## Caution

- Do not use ball valves where media has suspended particles. Use the following valves: Butterfly valves – PVDF disc is most abrasion resistant. Make sure of chemical compatibility. Diaphragm valves – Elastomeric diaphragm is designed for handling suspended particles.
- Volatile fluids such as sodium hypochlorite (NaClO) and hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) could be trapped and gasified within the valve. We can provide you with a Type-21 ball valve with a vented ball to relieve pressure build-up inside the valve.

## Troubleshooting

### What if the fluid still flows when valve is closed?

1. Carrier is not properly tightened. Tighten it.
2. PTFE seat is damaged or worn. Replace seat.
3. Foreign material is caught between ball and PTFE seat. Remove material and clean.
4. Ball is damaged or worn. Change ball.

### What if fluid leaks outside of valve?

1. Union nut not properly tightened. Retighten.
2. Carrier is not properly tightened. Thread it in firmly.
3. Carrier or face O-ring is damaged, worn, or missing. Replace O-ring.

### What if handle does not rotate smoothly?

1. Foreign material has formed on the ball or seat. Clean both.
2. Internal part(s) chemically attacked or swollen. Refer to Asahi/America Chemical Resistance Chart for compatibility. Replace part(s) as required.
3. Carrier overtightened. Retighten properly.

### What if handle rotates too freely?

1. Stem is damaged. Replace stem.
2. Handle is not engaged with stem. Disassemble and reengage. Inspect.
3. Engaging part of stem and/or ball is damaged. Change stem and/or ball.