

## CRP201F Series 2-way Ball Valves

### Product Data Sheet



#### < STANDARDS >



ASTM D1784    ASTM D4101  
 ASTM D2464    ASTM F437  
 ASTM D2466    ASTM F439  
 ASTM D2467    ASTM F1498

CR-TEC CRP201F Series 2-way Ball Valves offer a variety of advanced features such as the patented seat stop carrier, a high quality stem and ball support system, and a multifunctional locking handle. The new DUAL BLOCK® system locks the union nuts preventing back-off due to vibration or thermal cycling. Deep grooves, thick o-rings, and cushioned Teflon® seats contribute to strong seals at pressures up to 232 PSI while an integral mounting flange and support bracketing combine for simple adaptation for actuation and anchoring.



ANSI B1.20.1



ISO 11922-1



#### VALVE AVAILABILITY

BODY MATERIAL	PVC, CPVC, PP
SIZE RANGE	1/2" through 4"
PRESSURE	up to 232 PSI, 150 PSI (PP)
SEATS	Teflon® (PTFE)
SEALS	EPDM or FPM
END CONNECTIONS	Socket (IPS), Threaded (FNPT) Socket (Metric)

**Note:** PVDF valves available on request

### Sample Specification

#### 1.1 Material

- The valve body, stem, ball and unions shall be made of PVC compound which shall meet or exceed the requirements of cell classification 12454 according to ASTM D1784.
- or The valve body, stem, ball and unions shall be made of Corzan® CPVC compound which shall meet or exceed the requirements of 23447 according to ASTM D1784.
- or The valve body, stem, ball and unions shall be made of stabilized PP homopolymer compound, also containing a RAL 7032 pigment, which shall meet or exceed the requirements of Type I Polypropylene according to ASTM D4101.

#### 1.2 Seats

- The ball seats shall be made of Teflon® (PTFE).

#### 1.3 Seals

- The o-ring seals shall be made of EPDM.
- or The o-ring seals shall be made of FPM.

### 2.0 Connections

#### 2.1 Socket style

- The IPS socket PVC end connectors shall conform to the dimensional standards ASTM D2466 and ASTM D2467.
- or The IPS socket CPVC end connectors shall conform to the dimensional standard ASTM F439.
- or The Metric socket PP end connectors shall conform to the dimensional standard ISO 11922-1.

#### 2.2 Threaded style

- The female NPT threaded PVC end connectors shall conform to the dimensional standards ASTM D2464, ASTM F1498, and ANSI B1.20.1.
- or The female NPT threaded CPVC end connectors shall conform to the dimensional standards ASTM F437, ASTM F1498, and ANSI B1.20.1.
- or The female NPT threaded PP end connectors shall conform to the dimensional standards ASTM F1498, and ANSI B1.20.1.

### 3.0 Design Features

- The valve shall be double blocking with union ends.
- All valves shall be full port.
- All valves shall allow for bi-directional flow.

- The valve body shall be single end entry with a threaded carrier (ball seat support).
- The threaded carrier shall be adjustable with the valve installed.
- The valve body shall have an expansion and contraction compensating groove on the molded end.
- The valve body, union nuts, and carrier shall have deep square style threads for increased strength.
- The ball and stem shall be machined smooth to minimize wear on valve seats and seals.
- All valve seats shall have o-ring backing cushions to compensate for wear and prevent seizure of the ball.
- The stem design shall feature double o-ring seals as well as a safety shear point above the o-rings.
- All valves shall have integrally molded mounting features for actuation.
- All valves shall have integrally molded support bracketing for anchoring.
- 2-1/2" to 4" valves handle shall incorporate a transparent PVC plug and tag holder for valve identification.

### 3.1 Pressure Tested

- All valves shall have been pressure tested in both the open and closed positions by the manufacturer.

### 3.2 Pressure Rating

- All PVC and CPVC valves shall be rated at 232 PSI at 73°F.
- All PP valves shall be rated at 150 PSI at 73°F.

### 3.3 Markings

- All valves shall be marked to indicate size, material designation, and manufacturers name or trade mark.

### 3.4 Color Coding

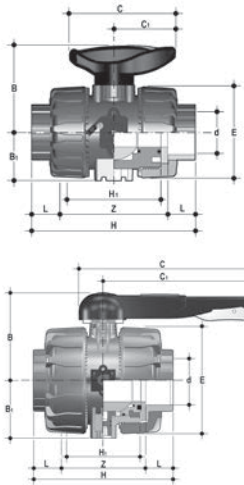
- All PVC valves shall be color-coded dark gray.
- or All CPVC valves shall be color-coded light gray.
- or All PP valves shall be color-coded beige gray.

### 4.0 NSF 61 listing.

- All PVC and CPVC valves shall be listed with NSF to Standard 61 for potable water.

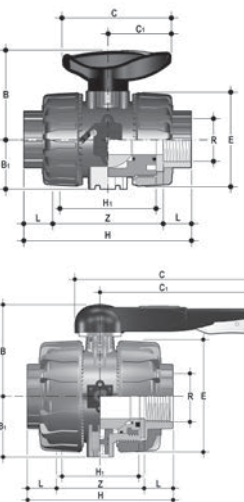
### 5.0 All valves shall be Xirtec® PVC, Xirtec® CPVC or PP

Dimensions



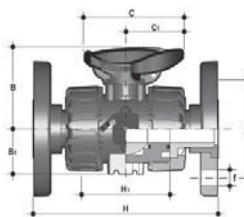
IPS Socket Connections – Dimension (inches)

Size	d	H	L	Z	H <sub>1</sub>	E	B <sub>1</sub>	B	C <sub>1</sub>	C
3/8	0.68	4.61	0.77	3.07	2.56	2.13	1.14	2.13	1.57	2.64
1/2	0.84	4.61	0.89	2.83	2.56	2.13	1.14	2.13	1.57	2.64
3/4	1.05	5.08	1.00	3.07	2.76	2.56	1.36	2.56	1.93	3.35
1	1.32	5.59	1.13	3.33	3.07	2.87	1.54	2.74	1.93	3.35
1-1/4	1.66	6.38	1.26	3.86	3.46	3.39	1.81	3.25	2.52	4.25
1-1/2	1.90	6.77	1.38	4.02	3.66	3.86	2.05	3.50	2.52	4.25
2	2.38	7.83	1.50	4.83	4.37	4.80	2.44	4.25	2.99	5.28
2-1/2	2.88	9.25	1.75	5.75	5.24	6.46	3.43	6.46	6.89	8.86
3	3.50	10.63	1.89	6.85	5.87	7.99	4.13	6.97	10.71	12.87
4	4.50	12.13	2.26	7.60	6.57	9.37	5.08	7.68	12.99	15.16



Female NPT Threaded Connections – Dimension (inches)

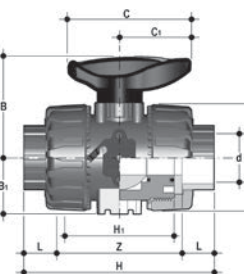
Size	R	H	L	Z	H <sub>1</sub>	E	B <sub>1</sub>	B	C <sub>1</sub>	C
3/8	3/8-UPT	4.06	0.54	2.98	2.56	2.13	1.14	2.13	1.57	2.69
1/2	1/2-NPT	4.37	0.70	2.97	2.56	2.13	1.14	2.13	1.57	2.64
3/4	3/4-NPT	4.61	0.71	3.19	2.76	2.56	1.36	2.56	1.93	3.35
1	1-NPT	5.31	0.89	3.54	3.07	2.87	1.54	2.74	1.93	3.35
1-1/4	1-1/4-NPT	6.02	0.99	4.05	3.46	3.39	1.81	3.25	2.52	4.25
1-1/2	1-1/2-NPT	6.14	0.97	4.20	3.66	3.86	2.05	3.50	2.52	4.25
2	2-NPT	7.32	1.17	4.99	4.37	4.80	2.44	4.25	2.99	5.28
2-1/2	2-1/2-NPT	9.25	1.31	6.64	5.24	6.46	3.43	6.46	6.89	8.86
3	3-NPT	10.63	1.40	7.83	5.87	7.99	4.13	6.97	10.71	12.87
4	4-NPT	12.13	1.48	9.17	6.57	9.37	5.08	7.68	12.99	15.16



Flanged Connections – Dimension (inches)

Size	H	H <sub>1</sub>	B	B <sub>1</sub>	C	C <sub>1</sub>	F	f	U
1/2"	5.63	2.56	2.13	1.14	2.64	1.58	2.37	0.63	0.16
3/4"	6.77	2.76	2.56	1.36	3.35	1.93	2.75	0.63	0.16
1"	7.36	3.07	2.74	1.54	3.35	1.93	3.13	0.63	0.16
1 1/4"	7.48	3.47	3.25	1.81	4.25	2.52	3.5	0.63	0.16
1 1/2"	8.35	3.66	3.5	2.05	4.25	2.52	3.87	0.63	0.16
2"	9.21	4.37	4.25	2.44	5.28	2.99	4.75	0.75	0.16

Note: Dimensions based on VKD ANSI 150 Flanging Kit

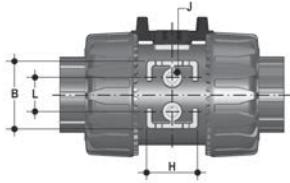


Metric Socket Connections – Dimension (inches)

Size	d	H	L	Z	H <sub>1</sub>	E	B <sub>1</sub>	B	C <sub>1</sub>	C
20mm	0.79	4.02	0.57	2.87	2.56	2.13	1.14	2.13	1.57	2.64
25mm	0.98	4.49	0.63	3.23	2.76	2.56	1.36	2.56	1.93	3.35
32mm	1.26	4.96	0.71	3.54	3.07	2.87	1.54	2.74	1.93	3.35
40mm	1.57	5.55	0.81	3.94	3.35	3.39	1.81	3.25	2.52	4.25
50mm	1.97	6.46	0.93	4.61	3.66	3.86	2.05	3.50	2.52	4.25
63mm	2.48	7.83	1.08	5.67	4.37	4.80	2.44	4.25	2.99	5.28

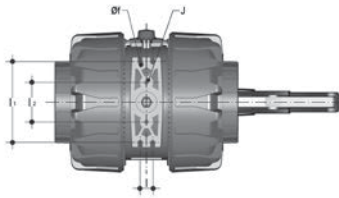
# CRP201F Series 2-way Ball Valves

## Product Data Sheet



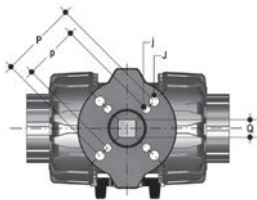
Support Bracket – Dimension (inches)

Size	J	B	L	H
1/2	M4	1.24	0.79	1.06
3/4	M4	1.57	0.79	1.18
1	M4	1.57	0.79	1.18
1-1/4	M6	1.97	1.18	1.38
1-1/2	M6	1.97	1.18	1.38
2	M6	2.36	1.18	1.57



Support Bracket – Dimension (inches)

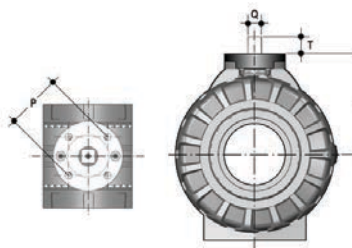
Size	J	f	l	l1	l2
2-1/2	M6	0.25	0.69	3.54	2.04
3	M8	0.33	0.83	4.43	2.48
4	M8	0.33	0.83	5.39	2.64



Actuation Pad – Dimension (inches)

Size	B <sub>2</sub>	p	P	j	J	T	Q
1/2	2.28	F03	F04	0.22	0.22	0.47	0.43
3/4	2.89	F03	F05	0.22	0.26	0.47	0.43
*3/4	2.89	F04		0.22		0.47	0.43
1	2.91	F03	F05	0.22	0.26	0.47	0.43
*1	2.91	F04		0.22		0.43	0.43
1-1/4	3.82	F05	F07	0.26	0.33	0.63	0.55
1-1/2	4.09	F05	F07	0.26	0.33	0.63	0.55
2	4.49	F05	F07	0.26	0.33	0.63	0.55

\*Available upon request.



Actuation Pad – Dimension (inches)

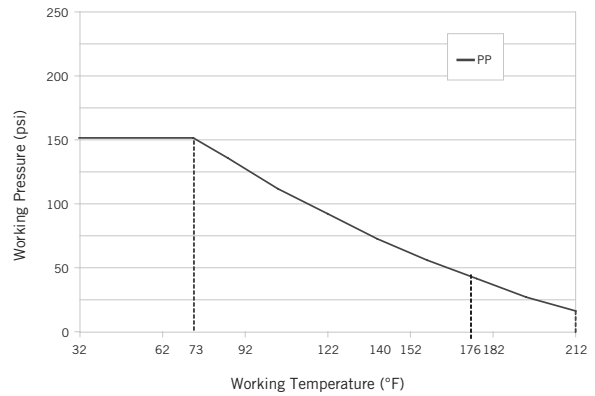
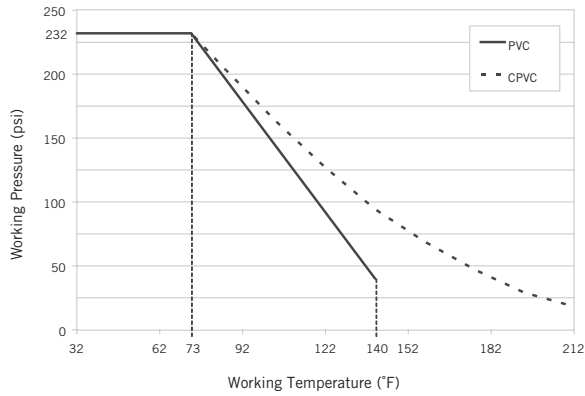
Size	P	J	T	Q
2-1/2	F07	0.35	0.63	0.55
3	F07	0.35	0.63	0.55
4	F07	0.35	0.75	0.67

### Weights

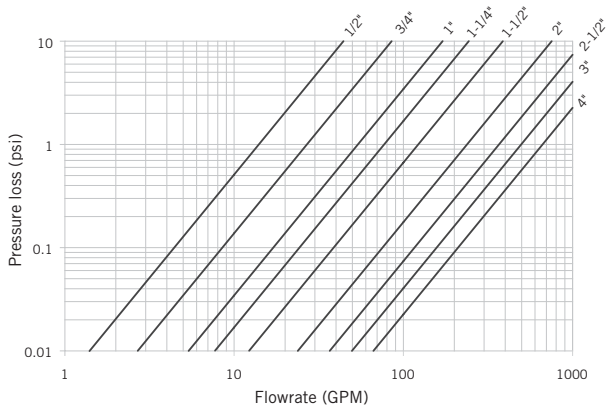
Approximate Weight (lbs)

Size (inches)	IPS / Metric Socket				FNPT Threaded			
	IPS	Metric	PVC	CPVC	PP	PVC	CPVC	PP
1/2		20mm	0.47	0.51	0.32	0.46	0.50	0.31
3/4		25mm	0.76	0.82	0.48	0.74	0.79	0.50
1		32mm	0.99	1.06	0.66	0.99	1.06	0.67
1-1/4		40mm	1.58	1.70	1.06	1.49	1.61	1.01
1-1/2		50mm	2.15	2.31	1.50	2.11	2.26	1.43
2		63mm	3.77	4.06	2.57	3.68	3.95	2.50
2-1/2		-	9.68	10.5	-	9.69	10.5	-
3		-	15.9	17.3	-	16.0	17.4	-
4		-	24.4	26.9	-	24.5	27.0	-

### Pressure – Temperature Ratings



### Pressure Loss Chart



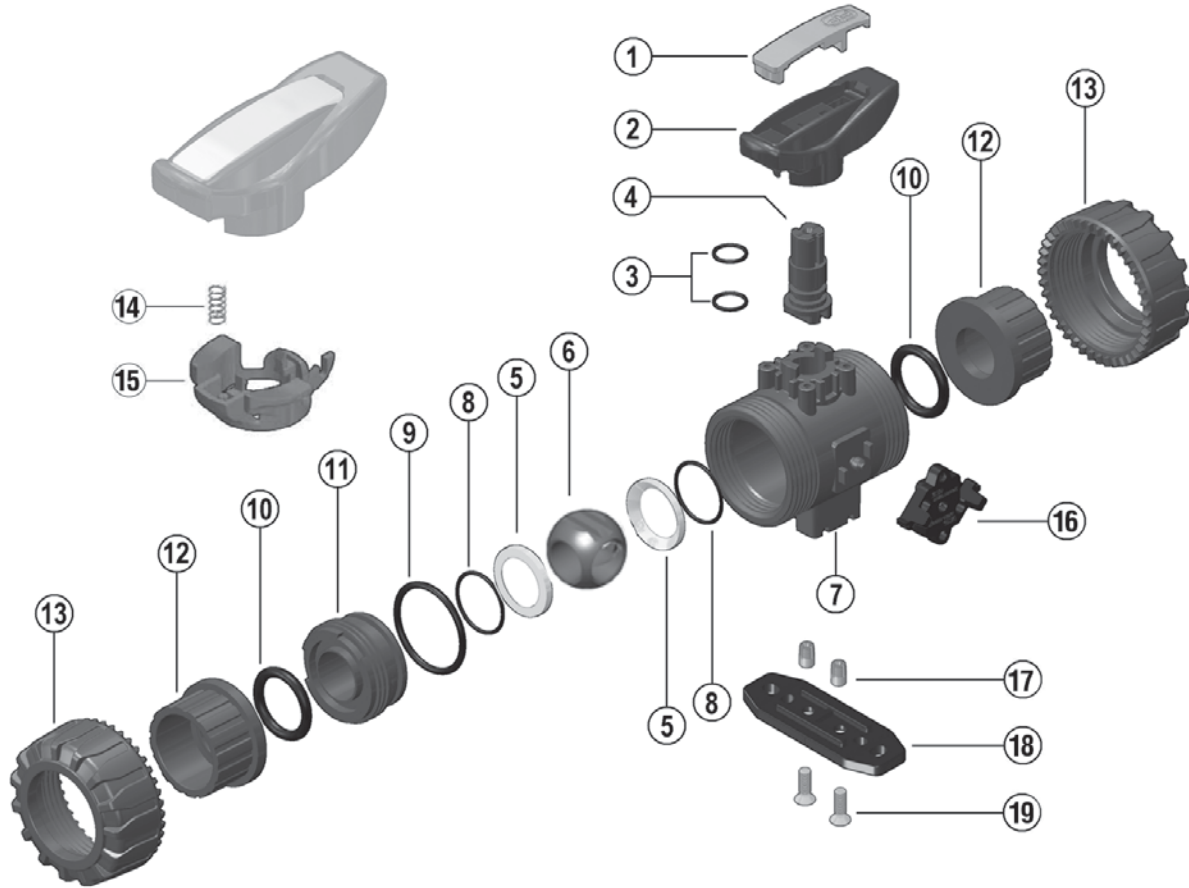
### Flow Coefficients

Size (in)	C <sub>v</sub>
1/2	14.0
3/4	27.0
1	53.9
1-1/4	77.0
1-1/2	123
2	238
2-1/2	368
3	497
4	665

# CRP201F Series 2-way Ball Valves

## Product Data Sheet

Components: Sizes 1/2" to 2"



#	Component	Material	Qty
1	insert	PVC / CPVC / PP	1
2	handle	PVC / CPVC / PP	1
3	stem o-ring	EPDM / FPM	2
4	stem	PVC / CPVC / PP	1
5	ball seat	PTFE	2
6	ball	PVC / CPVC / PP	1
7	body	PVC / CPVC / PP	1
8	ball seat o-ring	EPDM / FPM	2
9	body o-ring	EPDM / FPM	1
10	socket o-ring	EPDM / FPM	2

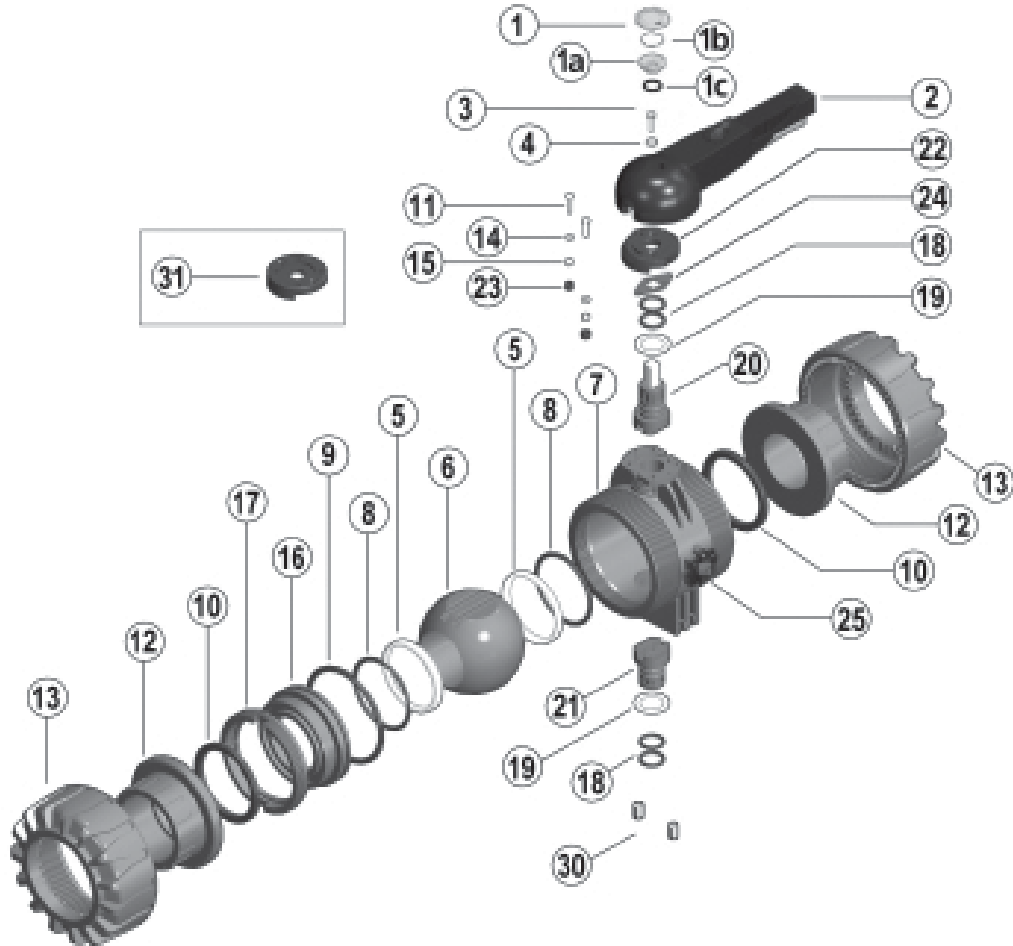
#	Component	Material	Qty
11	carrier with stop ring	PVC / CPVC / PP	1
12	end connector	PVC / CPVC / PP	2
13	union nut	PVC / CPVC / PP	2
14*	spring	SS	1
15*	handle lock	GRPP	1
16	DUAL BLOCK®	POM	1
17*	bracket bushing	SS / brass	2
18*	mounting plate	GRPP	1
19*	screw	SS	2

\* Optional Accessories

# CRP201F Series 2-way Ball Valves

## Product Data Sheet

Components: Sizes 2-1/2" to 4"



#	Component	Material	Qty
1 a,b,c	transparent service plug	PE	1
2	handle	PVC	1
3	bolt	SS	1
4	washer	SS	1
5	ball seat	PTFE	2
6	ball	PVC / CPVC	1
7	body	PVC / CPVC	1
8	ball seat o-ring	EPDM / FPM	2
9	body o-ring	EPDM / FPM	1
10	socket seal	EPDM / FPM	2
11	bolt	SS	2
12	end connector	PVC / CPVC	2
13	union nut	PVC / CPVC	2
14	washer	SS	2
15	nut	SS	2
16	carrier	PVC / CPVC	1

#	Component	Material	Qty
17	stop ring	PVC / CPVC	1
18	stem o-ring	EPDM / FPM	4
19	bushing	PTFE	2
20	upper stem	PVC / CPVC & SS	1
21	lower stem	PVC / CPVC	1
22	pad	GRPP	1
23	protective cap	PE	2
24	spring	SS	2
25	nut block	GRPP	2
26	cover	PP	1
27	nut block button	GRPP	1
28	protective cap	PE	1
29	screw	nylon	2
30	bracket bushing	brass	2
31	actuation pad	GRPP	1

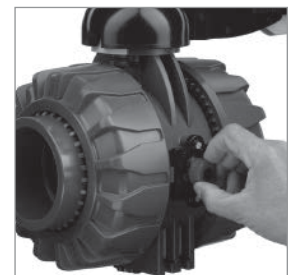
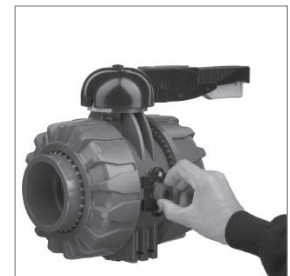
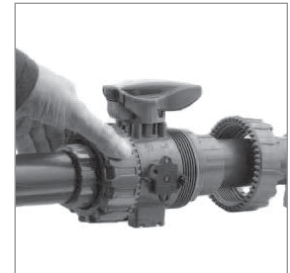
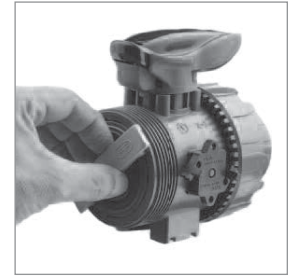
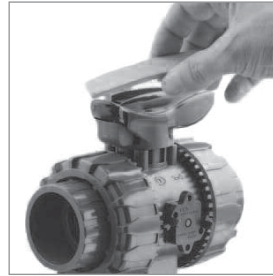


# CRP201F Series 2-way Ball Valves

## Product Data Sheet

### Installation Procedures

1. Remove the union nuts (part #13 on previous pages) and slide them onto the pipe.
2. Please refer to the appropriate connection style sub-section:
  - a. For socket style, solvent cement or fuse the end connectors (12) onto the pipe ends. **Be sure to allow sufficient cure time before continuing with the valve installation.**
  - b. For threaded style, thread the end connectors (12) onto the pipe ends.
3. Open and close the valve to ensure that the carrier (11 or 16) is at the desired adjustment. If adjustment is required, ensure that the valve is in the closed position then remove the insert tool (1) from the handle (2). For sizes 2-1/2" to 4", use the tool that accompanies the valve. Line up the moldings on the tool with the slots in the carrier. Tighten or loosen to the desired position then replace the tool on the handle.
4. Ensure that the valve is in the closed position, and that the socket o-rings (10) are properly fitted in their grooves. If anchoring is required, insert the bracket bushings (17) into the bottom of the valve (sizes 1/2" to 2" only). Carefully place the valve in the system between the two end connections and fix if necessary.
5. Tighten the union nut on the side opposite to that which is marked "ADJUST". Hand tightening is typically sufficient to maintain a seal for the maximum working pressure. **Over-tightening may damage the threads on the valve body and/or the union nut, and may even cause the union nut to crack.**
6. Tighten the union nut on the side marked "ADJUST". Tightening the union nuts in this order results in the best possible valve performance due to optimum positioning and sealing of the ball and seat support system.
7. Open and close the valve to again ensure that the cycling performance is adequate. If adjustment is required, place the valve in the closed position, loosen the union nuts, remove the valve from the system, and then continue from Step 3.
8. Engage the Dual Block<sup>®</sup> system by affixing the molded piece (16, sizes 1/2" to 2") to the side of the valve body or by turning the red knob (27, sizes 2-1/2" to 4") to the locked position. This feature will prevent back-off of the union nuts during operation.



1/2" – 2" Dual Block<sup>®</sup>  
Mechanism

2-1/2" – 4" Dual Block<sup>®</sup>  
Mechanism



FREE



LOCK



### Valve Maintenance

#### Disassembly

1. If removing the valve from an operating system, isolate the valve from the rest of the line. **Be sure to depressurize and drain the valve and isolated branch.**
2. If necessary, detach the valve from the support structure by disassembling the connections to the optional bracket on the bottom of the valve body (7).
3. Unlock the Dual Block® system by compressing the two ends of the molded piece (16, sizes 1/2" to 2") or by turning the red knob (27, sizes 2-1/2" to 4") to the unlocked position. Loosen both union nuts (13) and drop the valve out of the line. If retaining the socket o-rings (10), take care that they are not lost when removing the valve from the line.
4. Place the valve in the open position then line up the moldings on the wrench tool (1, sizes 1/2" to 2") with the slots in the carrier (found on the side marked "ADJUST"). Loosen and remove the carrier (11 or 16).
5. Carefully press the ball (6) out of the valve body, taking care not to score or damage the outer surface.
6. Remove the handle (2) by pulling upwards (sizes 1/2" to 2") or by removing transparent service plug (1 a,b,c), bolt (3) and washer (4) (sizes 2-1/2" to 4").
7. On sizes 2-1/2" to 4", remove the throttling pad (22) by loosening and removing the bolts (11), washers (14), nuts (15), and caps (23).
8. Press the stem (4 or 20) into the valve body from above. On sizes 2-1/2" to 4", remove the lower stem (21) by pushing it into the valve body from below.
9. The stem o-rings (3 or 18), body o-ring (9), ball seats (5), ball seat o-rings (8), and bushings (19, sizes 2-1/2" to 4") can now be removed and/or replaced.

**Note:** It is not typically necessary to disassemble the Dual Block® components.

#### Assembly

**Note:** Before assembling the valve components, it is advisable to lubricate the o-rings with a water soluble lubricant. **Be sure to consult your Chemical Resistance Guide and/or other trusted resources to determine specific lubricant-rubber compatibilities.**

1. Replace the stem o-rings (3 or 18), body o-ring (9), ball seat o-rings (8), ball seats (5), and bushings (19, sizes 2-1/2" to 4") in their proper positions.
2. Insert the stem (4 or 20) into position from inside the valve body (7). On sizes 2-1/2" to 4", insert the lower stem (21) as well.
3. On sizes 2-1/2" to 4", replace the throttling pad (22) and affix in position using the bolts (11), washers (14), and nuts (15). Replace the caps (23) over the nuts.
4. Replace the handle (2). On sizes 2-1/2" to 4", affix using the bolt (3) and washer (4), then replace the transparent service plug (1 a,b,c).
5. Carefully insert the ball (6) into the valve body, taking care not to score or damage the outer surface. **Ensure that the valve handle and ball position correspond to the same operating position.**
6. Insert the threaded carrier (11 or 16) and tighten into the valve body. Use the wrench tool to sufficiently tighten.
7. Place the end connectors (12) into the union nuts (13), then thread onto the valve body taking care that the socket o-rings remain properly fitted in their grooves.
8. Engage the Dual Block® system by affixing the molded piece (16, sizes 1/2" to 2") to the side of the valve body or by turning the red knob (27, sizes 2-1/2" to 4") to the locked position.



### Testing & Operation

The purpose of system testing is to assess the quality of all joints and fittings to ensure that they will withstand the design working pressure, plus a safety margin, without loss of pressure or fluid. Typically, the system will be tested and assessed in sub-sections as this allows for improved isolation and remediation of potential problems. With this in mind, the testing of a specific installed valve is achieved while carrying out a test of the overall system.

**In any test or operating condition, it is important to never exceed the pressure rating of the lowest rated appurtenance in the system.**

Important points:

- Never test thermoplastic piping systems with compressed air or other gases including air-over-water boosters.
- When testing, do not exceed the rated maximum operating pressure of the valve.
- Avoid the rapid closure of valves to eliminate the possibility of water hammer which may cause damage to the pipeline or the valve.

**For safety reasons, please contact CR-TEC when using volatile liquids such as hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) and sodium hypochlorite (NaClO). These liquids may vaporize causing a potentially dangerous pressure increase in the dead space between the ball and the valve body. Special ball valves are available for these types of critical applications.**

Size 2-1/2"

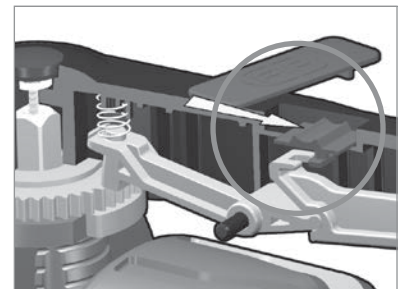


FREE

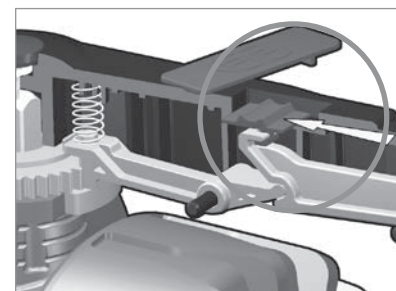


LOCK

Size 3" - 4"



FREE



LOCK

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## **CR-TEC Engineering Inc.**

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**CR-TEC Engineering Inc.**

15 Orchard Park Road, Unit 18  
Telephone 203-318-9500 • Fax 203-245-2575  
info@crtec.com • www.crtec.com