

Sinclair Collins®

Process Control Valves

*Cold Service Control Valves
For Raw Water, Oil, Water
and Soluble Oil*

*Catalog SCV-3/USA
February 2002*



 **WARNING**

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH , PERSONAL INJURY AND PROPERTY DAMAGE.

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The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

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2- & 3-Way Valves - Diaphragm Operated

Sinclair Collins® High Pressure Valves are available in 2-way normally-open or normally-closed, and 3-way types in two pressure classes - 4000 psi and 6000 psi. Valves for 4000 psi services have cast bodies of high quality ASTM-B61 bronze and are available in sizes ranging from 1/2" through 3". Bodies for 6000 pi valves are machined from aluminum bronze billets. These valves are available in 1/2" through 2" sizes. All valves are normally equipped with seals that are suitable for use with water and petroleum base fluids; however, seals for use with phosphate ester base fluids and other services are available on special order.



4000 psi
(275.8 bar)



6000 psi
(413.8 bar)

Maximum Temperature: 160°F (71°C)

Seat Sleeve Construction

Sinclair Collins® High Pressure Valves employ a seat sleeve construction. The seat sleeve (shown below) is made of hardened stainless steel and is very rugged. It very successfully resists the cutting action of high

velocity water. Seats are lapped in place to assure drop tight seating. Each valve assembly must pass a drop-tight test at rated pressure before shipment.

3-Way Operation Illustrated

The upper and lower seats are always in perfect alignment with this integral seat-sleeve construction. The seat-sleeve, which registers in the body bore, requires no special wrenches for assembly. This type of construction also insures against seepage through the seats due to body breathing. Seat-sleeves on two-way valves may be turned end for end thus exposing a new and unused seat for continued use. All ports in the seat

sleeve of three-way valves are spaced to prevent water loss when the stem is moved from one seat to another. The ports are also staggered, which causes the flow through the valve to be increased or diminished gradually. This staggered porting tends to reduce hydraulic shock. Because of the port spacing in the seat sleeve, the seats are protected from the cutting action of the hydraulic medium.



**Air Off Top
 Normal Position**



Mid Stroke



Air On Top

Stem Assembly

Valve stems are made of hardened stainless steel. Stem friction is held to a minimum through the use of "O"-ring seals with PTFE back-up rings. PTFE scraper rings are also installed in the yoke to wipe the stem clean and prevent the entry of dirt and grit

which might shorten "O" ring life. Three way stems are in hydraulic balance to provide smoother, freer operation. All seals are made of synthetic rubber which will not cause electrolytic action or any chemical action between metallic parts and seals.

Stem Assembly



Hard Faced Seats

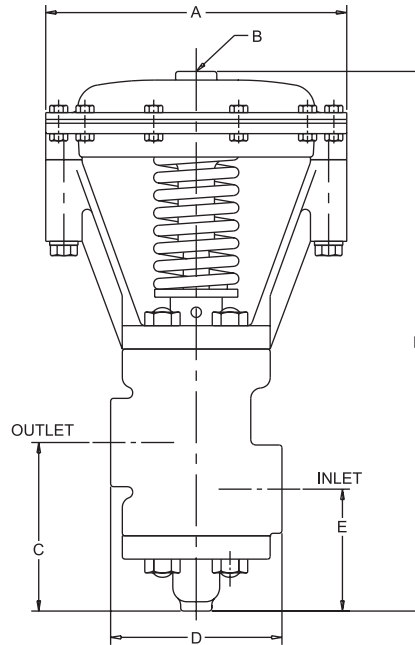
4000 psi (275.8 bar) 2-Way Normally Closed, Tapped 1/2" & 3/4"

Media: Raw Water, Oil, Water and Soluble Oil

Size (NPTF)	Model Number	Cv	Max. Temp.	Air Pressure On Top
1/2"	C204-2001	3.30	160°F	30-40 psi
3/4"	C204-3001	3.55	(71°C)	(2.1-2.8 bar)

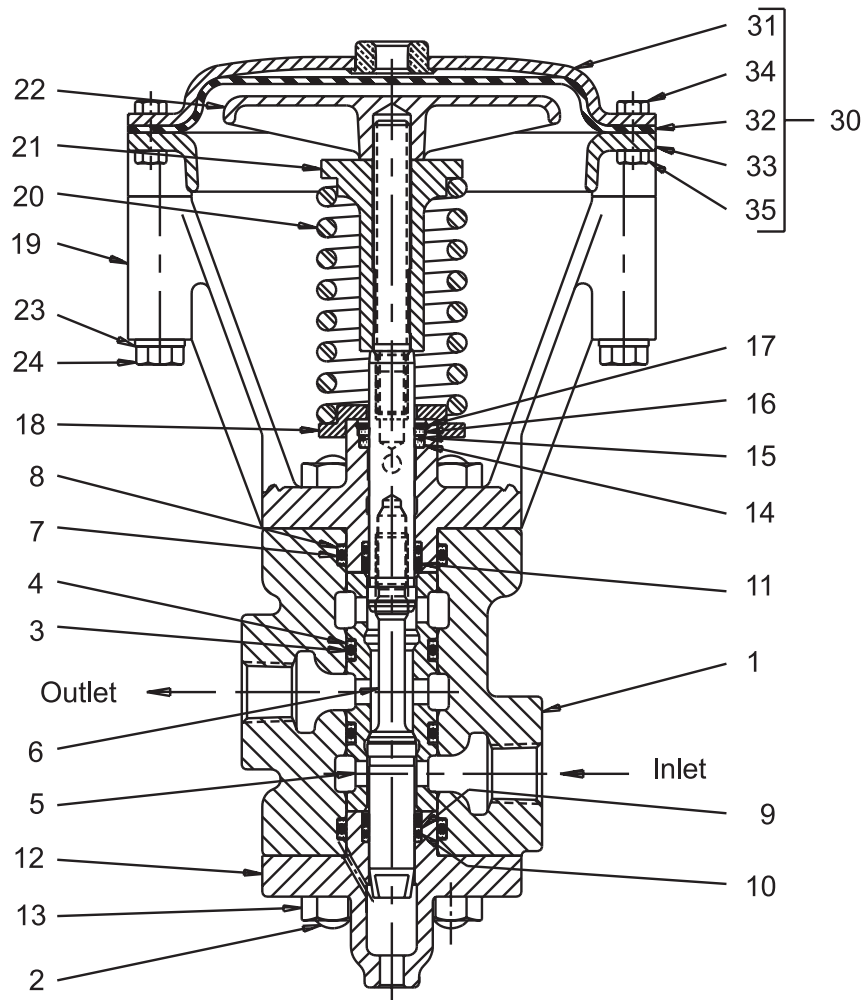
Installation

"Normally Closed" valves should be piped so that incoming fluid enters below the valve seat. For proper installation, the inlet must be connected to the pipe port nearest the bottom or cap end of the valve body.



Basic Dimensions

Size (NPTF)	Model Number		A	B	C	D	E	F
1/2"	C204-2001	inch	7.25	1/4"	4.06	4.12	2.94	13.00
		mm	184	NPTF	103	105	75	330
3/4"	C204-3001	inch	7.25	1/4"	4.06	4.12	2.94	13.00
		mm	184	NPTF	103	105	75	330



Size (NPTF)	1/2"	3/4"	Description
Model No.	C204-2001	C204-3001	
Item No.	Part Number		
1	C093-095	C093-043	Body
2	D153-024	D153-024	Stud
• 3	H135-51	H135-51	O-Ring (2)
• 4	H143-13	H143-13	Back-Up Washer (4)
5	D013-001	D013-001	Seat Sleeve
6	C332-012	C332-012	Stem Assembly
• 7	H136-24	H136-24	O-Ring (2)
• 8	H143-21	H143-21	Back-Up Washer (4)
• 9	H143-03	H143-03	Back-Up Washer (4)
• 10	H135-11	H135-11	O-Ring (2)
11	D043-065	D043-065	Spacer
12	C213-050	C213-050	Bottom Cap
13	H060-23	H060-23	Hex. Nut
• 14	H092-02	H092-02	Wiper Ring (1)
• 15	D043-076	D043-076	Spacer (1)
• 16	H092-01	H092-01	Scraper Ring (1)

Size (NPTF)	1/2"	3/4"	Description
Model No.	C204-2001	C204-3001	
Item No.	Part Number		
• 17	H090-19	H090-19	Retaining Ring (1)
18	D083-015	D083-015	Spring Seat
19	D283-020	D283-020	Yoke
20	D293-037	D293-037	Spring
21	C633-016	C633-016	Spring Nut
22	C783-045	C783-045	Piston
23	H175-21	H175-21	Lock Washer
24	H096-56	H096-56	Cap Screw
30	C392-005	C392-005	Diaph. Top Ass'y.
31	C293-023	C293-023	Cover
32	C333-017	C333-017	Diaphragm
33	C893-014	C893-014	Ring
34	H096-10	H096-10	Cap Screw
35	H060-03	H060-03	Hex. Nut
	C182-040	C182-040	Seal Kit

• Included in Seal Kit.

Note: When ordering parts, always specify valve size as well as description and part number.

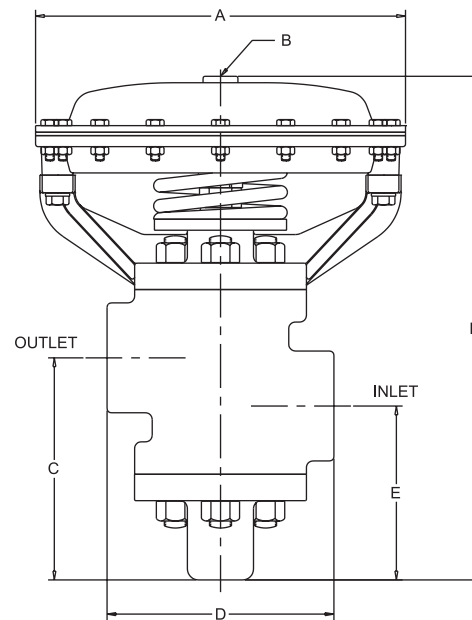
4000 psi (275.8 bar) 2-Way Normally Closed, Tapped 1", 1-1/4", 1-1/2", 2" & 3"

Media: Raw Water, Oil, Water and Soluble Oil

Size (NPTF)	Model Number	Cv	Max. Temp.	Air Pressure On Top
1"	C204-4001	7.4	160°F (71°C)	30-40 psi (2.1-2.8 bar)
1-1/4"	C204-5001	11.8		
1-1/2"	C204-6001	17.0		
2"	C204-7001	28.0		
3"	C204-9001	54.0		

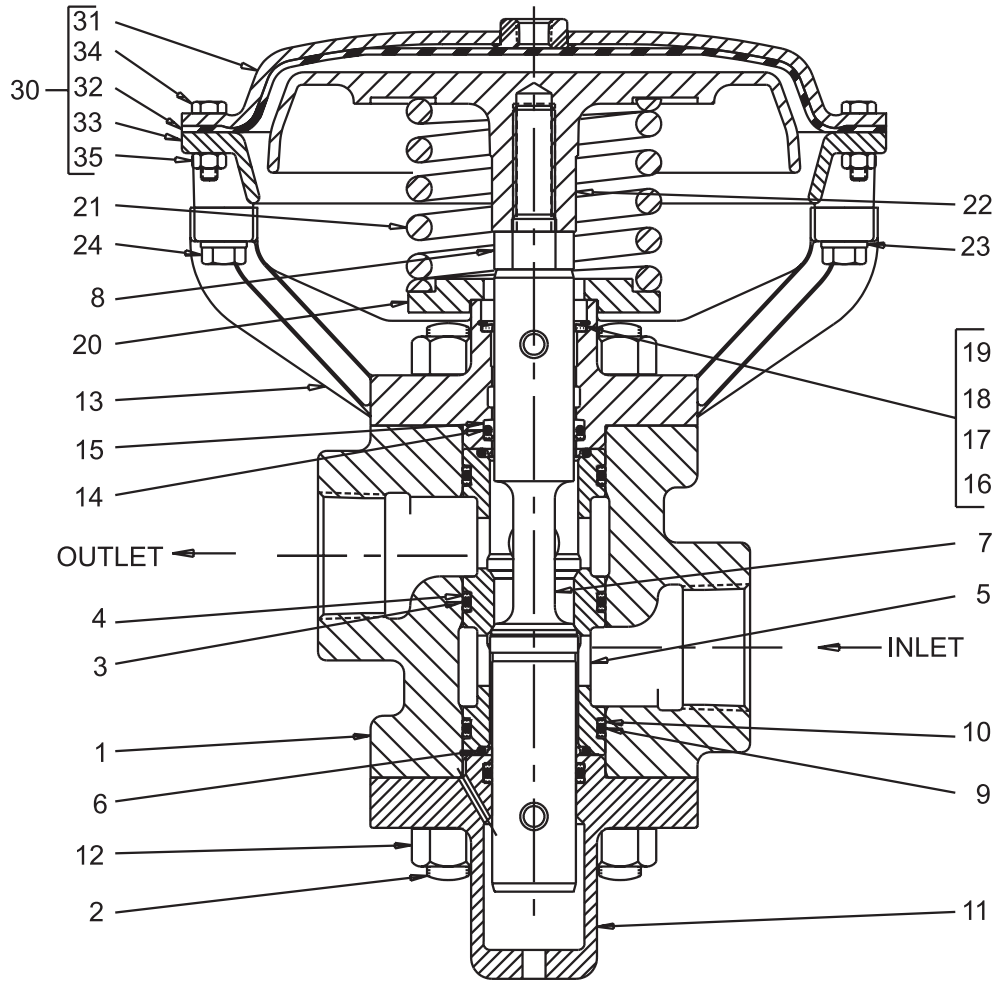
Installation

"Normally Closed" valves should be piped so that incoming fluid enters below the valve seat. For proper installation, the inlet must be connected to the pipe port nearest the bottom or cap end of the valve body.



Basic Dimensions

Size (NPTF)	Model No.		A	B	C	D	E	F
1"	C204-4001	inch	8.19	1/4"	5.28	4.62	4.16	12.47
		mm	208	NPTF	134	117	106	317
1-1/4"	C204-5001	inch	9.50	1/4"	5.19	5.75	4.06	12.28
		mm	241	NPTF	132	146	103	312
1-1/2"	C204-6001	inch	10.50	1/4"	6.31	6.44	4.94	15.19
		mm	267	NPTF	160	164	125	386
2"	C204-7001	inch	11.75	1/4"	7.38	7.75	5.31	16.31
		mm	298	NPTF	187	197	135	414
3"	C204-9001	inch	14.38	1/4"	8.84	10.75	8.03	22.47
		mm	365	NPTF	225	273	204	571



Size (NPTF)	1"	1-1/4"	1-1/2"	2"	3"	Description	Size (NPTF)	1"	1-1/4"	1-1/2"	2"	3"	Description
Model No.	C204-4001	C204-5001	C204-6001	C204-7001	C204-9001		Model No.	C204-4001	C204-5001	C204-6001	C204-7001	C204-9001	
Item No.	Part Number						Item No.	Part Number					
1	C093-062	C093-076	C093-094	C093-114	C093-203		Body	• 16	-	-	H092-15	H092-22	
2	D153-024	D153-024	D153-061	D153-061	D153-068	Stud	• 17	-	-	D043-091	D043-098	-	Spacer (1)
• 3	H136-29	H137-07	H137-24	H137-55	H138-06	O-Ring (3)	• 18	H092-03	H092-09	H092-14	H092-23	-	Scraper Ring (1)
• 4	H143-23	H143-26	H143-30	H143-39	H143-43	Back-Up Wash.(6)	• 19	H090-22	H090-47	H090-49	H090-52	-	Retainer Ring (1)
5	D013-003	D013-005	D013-007	D013-010	D013-012	Seat Sleeve	20	D083-012	D083-032	D083-037	D083-038	C923-038	Spring Seat
• 6	H135-51	H136-17	H136-43	H137-36	H137-55	O-Ring (2)	21	D293-022	D293-032	D293-035	D293-035	D293-053	Spring
7	D093-101	D093-124	D093-154	D093-178	C813-057	Female Stem	22	C783-056	C783-078	C783-091	C783-097	C783-121	Piston
	-	-	-	-	C813-058	Male Stem	23	H175-21	H175-21	H175-21	H175-21	H175-27	Lock Washer
8	D133-047	D133-054	D133-060	D133-064	D133-019	Stud	24	H096-52	H096-49	H096-48	H096-49	H097-08	Cap Screw
	-	-	-	-	D123-018	Stop	30	C392-007	C392-006	C392-008	C392-009	C392-013	Diaph.Top Ass'y.
• 9	H135-31	H135-51	H136-24	H137-20	H137-46	O-Ring (1)	31	C293-091	C293-030	C293-032	C293-036	C293-044	Cover
• 10	H143-09	H143-13	H143-21	H143-33	H143-37	Back-Up Wash.(2)	32	C333-022	C333-024	C333-030	C333-031	C333-039	Diaphragm
11	C213-048	C213-056	C213-075	C213-082	C213-091	Bottom Cap	33	C893-048	C893-022	C893-027	C893-031	C893-039	Ring
12	H060-23	H060-23	C573-016	C573-016	C573-016	Hex. Nut	34	H096-10	H096-10	H096-10	H096-10	H096-12	Cap Screw
13	D283-032	D283-056	D283-067	D283-089	D283-116	Yoke	35	H060-03	H060-03	H060-03	H060-03	H060-03	Hex. Nut
• 14	H135-22	H135-41	H136-17	H239-22	H137-46	O-Ring (1)		C182-038	C182-034	C182-036	C182-033	C182-017	Seal Kit
• 15	H143-06	H143-11	H143-19	H143-31	H143-37	Back-Up Wash.(2)							

• Included in Seal Kit.
 Note: When ordering parts, always specify valve size as well as description and part number.

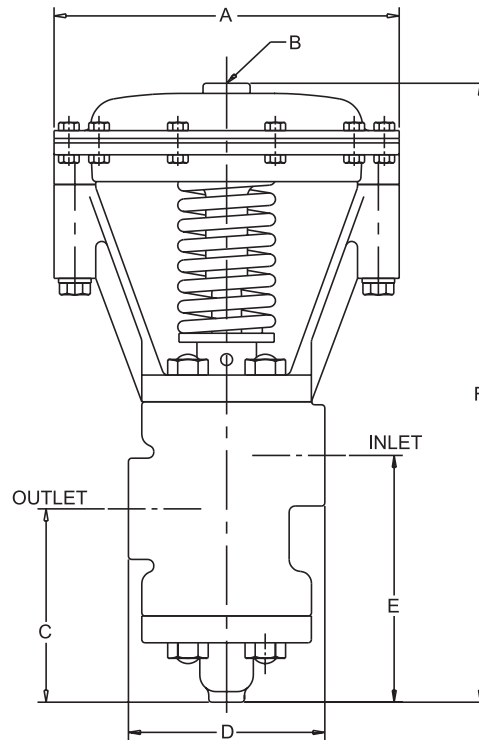
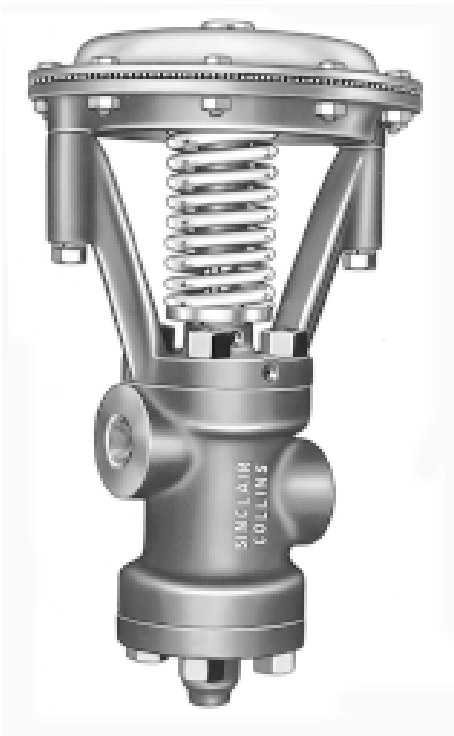
4000 psi (275.8 bar) 2-Way Normally Open, Tapped 1/2" & 3/4"

Media: Raw Water, Oil, Water and Soluble Oil

Size (NPTF)	Model Number	Cv	Max. Temp.	Air Pressure On Top
1/2"	C204-2002	3.30	160°F (71°C)	30-40 psi (2.1-2.8 bar)
3/4"	C204-3002	3.55		

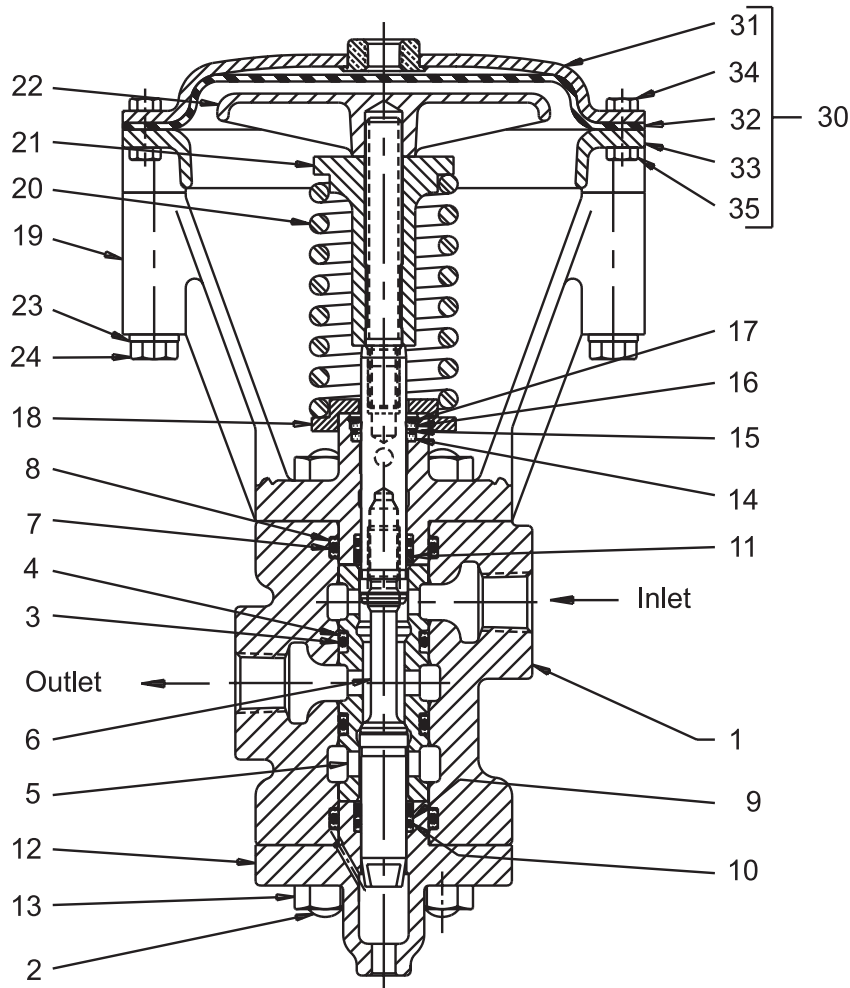
Installation

"Normally Open" valves should be piped so that incoming fluid enters above the valve seat. For proper installation, the inlet must be connected to the pipe port nearest the top or yoke end of the valve body.



Basic Dimensions

Size (NPTF)	Model Number		A	B	C	D	E	F
1/2"	C204-2002	inch	7.25	1/4"	4.06	4.12	5.19	13.00
		mm	184	NPTF	103	105	132	330
3/4"	C204-3002	inch	7.25	1/4"	4.06	4.12	5.19	13.00
		mm	184	NPTF	103	105	132	330



Size (NPTF)	1/2"	3/4"	Description
Model No.	C204-2002	C204-3002	
Item No.	Part Number		
1	C093-095	C093-043	Body
2	D153-024	D153-024	Stud
•3	H135-51	H135-51	O-Ring (2)
•4	H143-13	H143-13	Back-Up Washer (4)
5	D013-001	D013-001	Seat Sleeve
6	C332-012	C332-012	Stem Assembly
•7	H136-24	H136-24	O-Ring (2)
•8	H143-21	H143-21	Back-Up Washer (4)
•9	H143-03	H143-03	Back-Up Washer (4)
•10	H135-11	H135-11	O-Ring (2)
11	D043-065	D043-065	Spacer
12	C213-050	C213-050	Bottom Cap
13	H060-23	H060-23	Hex. Nut
•14	H092-02	H092-02	Wiper Ring (1)
•15	D043-076	D043-076	Spacer (1)
•16	H092-01	H092-01	Scraper Ring (1)

Size (NPTF)	1/2"	3/4"	Description
Model No.	C204-2002	C204-3002	
Item No.	Part Number		
•17	H090-19	H090-19	Retaining Ring (1)
18	D083-015	D083-015	Spring Seat
19	D283-020	D283-020	Yoke
20	D293-037	D293-037	Spring
21	C633-016	C633-016	Spring Nut
22	C783-045	C783-045	Piston
23	H175-21	H175-21	Lock Washer
24	H096-56	H096-56	Cap Screw
30	C392-005	C392-005	Diaph. Top Ass'y.
31	C293-023	C293-023	Cover
32	C333-017	C333-017	Diaphragm
33	C893-014	C893-014	Ring
34	H096-10	H096-10	Cap Screw
35	H060-03	H060-03	Hex. Nut
	C182-040	C182-040	Seal Kit

• Included in Seal Kit

Note: When ordering parts, always specify valve size as well as description and part number.

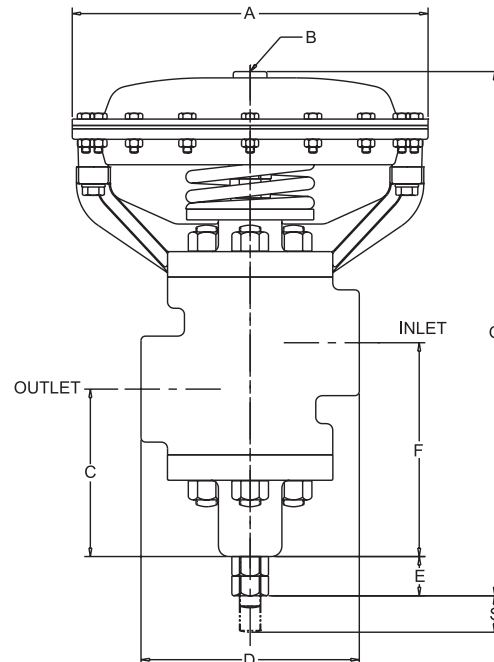
4000 psi (275.8 bar) 2-Way Normally Open, Tapped 1", 1-1/4", 1-1/2" 2" & 3"

Media: Raw Water, Oil, Water and Soluble Oil

Size (NPTF)	Model Number	Cv	Max. Temp.	Air Pressure On Top
1"	C204-4002	6.8	160°F (71°C)	30-40 psi (2.1-2.8 bar)
1-1/4"	C204-5002	11.4		
1-1/2"	C204-6002	17.0		
2"	C204-7002	28.0		
3"	C204-9002	51.0		

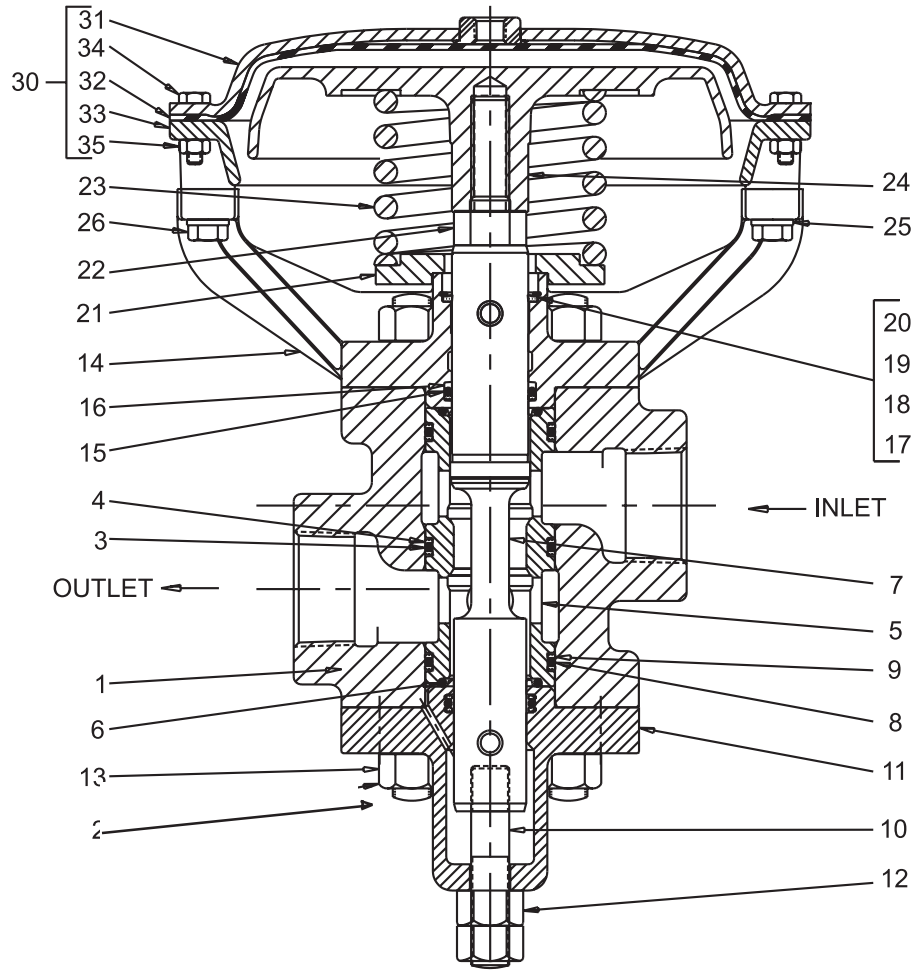
Installation

"Normally Open" valves should be piped so that incoming fluid enters above the valve seat. For proper installation, the inlet must be connected to the pipe port nearest the top or yoke end of the valve body.



Basic Dimensions

Size (NPTF)	Model Number		A	B	C	D	E	F	G	S
1"	C204-4002	inch	8.19	1/4"	4.19	4.62	1.00	5.31	13.00	.47
		mm	208	NPTF	106	117	25	135	330	12
1-1/4"	C204-5002	inch	9.50	1/4"	4.06	5.75	1.19	5.19	13.44	.50
		mm	241	NPTF	103	146	30	132	341	13
1-1/2"	C204-6002	inch	10.50	1/4"	4.94	6.44	1.44	6.31	15.75	.53
		mm	267	NPTF	125	164	37	160	400	13
2"	C204-7002	inch	11.75	1/4"	5.31	7.75	1.69	7.38	18.00	.84
		mm	298	NPTF	135	197	43	187	457	21
3"	C204-9002	inch	14.38	1/4"	8.06	10.75	1.62	8.88	24.06	1.09
		mm	365	NPTF	205	273	41	226	611	28



Size (NPTF)	1"	1-1/4"	1-1/2"	2"	3"	Description
Model No.	C204-4002	C204-5002	C204-6002	C204-7002	C204-9002	
Item No.	Part Number					
1	C093-062	C093-076	C093-094	C093-114	C093-203	Body
2	D153-024	D153-024	D153-061	D153-061	D153-068	Stud
• 3	H136-29	H137-07	H137-24	H137-55	H138-06	O-Ring (3)
• 4	H143-23	H143-26	H143-30	H143-39	H143-43	Back-Up Wash.(6)
5	D013-003	D013-005	D013-007	D013-010	D013-012	Seat Sleeve
• 6	H135-51	H136-17	H136-43	H137-36	H137-55	O-Ring (2)
7	D093-101	D093-124	D093-154	D093-178	C813-058	Male Stem
	-	-	-	-	C813-057	Female Stem
8	H135-22	H135-41	H136-17	H239-22	H137-46	O-Ring (1)
• 9	H143-06	H143-11	H143-19	H143-31	H143-37	Back-Up Wash.(2)
10	D153-017	D153-074	D153-073	D153-085	C913-020	Adj. Stud
11	C213-049	C213-057	C213-076	C213-084	C213-090	Bottom Cap
12	H060-15	H060-23	C573-016	H060-34	H060-34	Adj. Nut
13	H060-23	H060-23	C573-016	C573-016	C573-016	Hex. Nut
14	D283-030	D283-048	D283-074	D283-088	D283-116	Yoke
• 15	H135-31	H135-51	H136-24	H137-20	H137-46	O-Ring (1)
• 16	H143-09	H143-13	H143-21	H143-33	H143-37	Back-Up Wash.(2)

Size (NPTF)	1"	1-1/4"	1-1/2"	2"	3"	Description
Model No.	C204-4002	C204-5002	C204-6002	C204-7002	C204-9002	
Item No.	Part Number					
• 17	-	-	-	H092-25	-	Wiper (1)
• 18	-	-	-	D043-098	-	Spacer (1)
• 19	H092-05	H092-11	H092-16	H092-24	-	Scraper Ring (1)
• 20	H090-22	H090-47	H090-49	H090-52	-	Retainer Ring (1)
21	D083-011	D083-018	D083-034	D083-033	C923-038	Spring Seat
22	D133-011	D133-014	D133-043	D133-055	D133-051	Stem Stud
23	D293-028	D293-028	D293-032	D293-033	D293-053	Spring
24	C783-056	C783-078	C783-091	C783-097	C783-121	Piston
25	H175-21	H175-21	H175-21	H175-21	H175-27	Lock Washer
26	H096-52	H096-49	H096-48	H096-49	H097-08	Cap Screw
30	C392-007	C392-006	C392-008	C392-009	C392-013	Diaph. Top Ass'y.
31	C293-091	C293-030	C293-032	C293-036	C293-044	Cover
32	C333-022	C333-024	C333-030	C333-031	C333-039	Diaphragm
33	C893-048	C893-022	C893-027	C893-031	C893-039	Ring
34	H096-10	H096-10	H096-10	H096-10	H096-12	Cap Screw
35	H060-03	H060-03	H060-03	H060-03	H060-03	Hex. Nut
	C182-039	C182-035	C182-037	C182-032	C182-017	Seal Kit

• Included in Seal Kit.

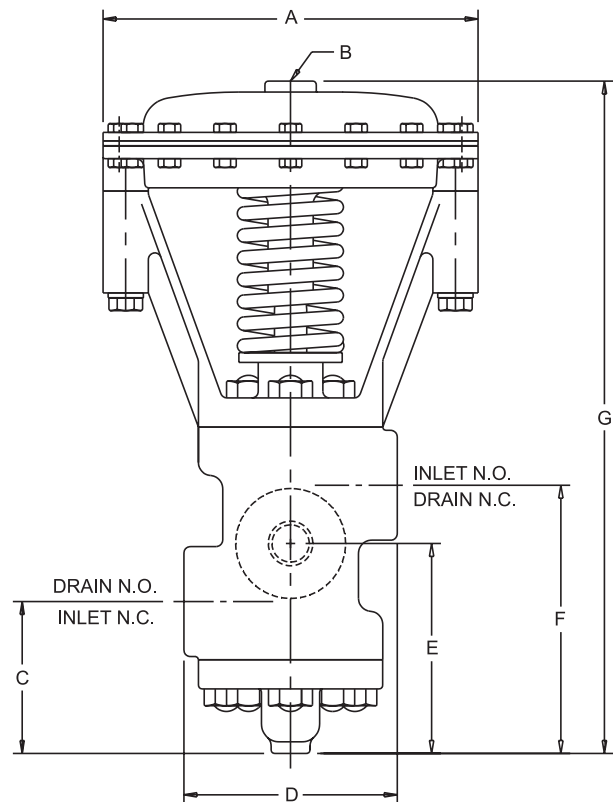
Note: When ordering parts, always specify valve size as well as description and part number.



4000 psi (275.8 bar) 3-Way, Tapped 1/2" & 3/4"

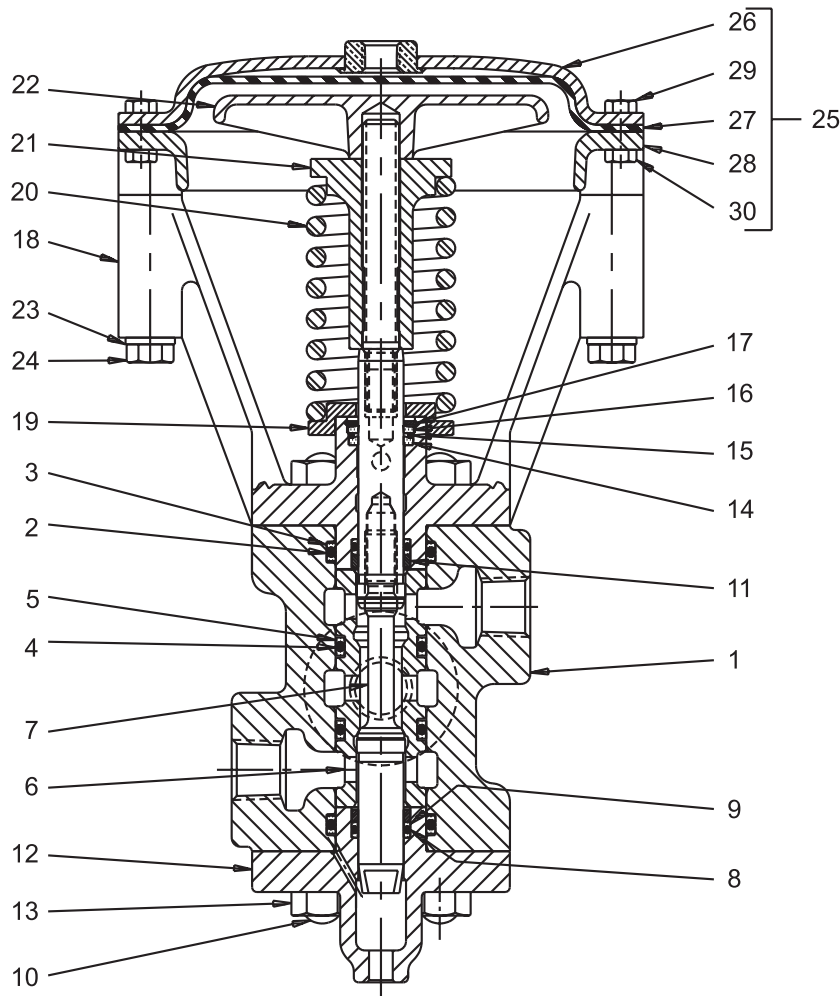
Media: Raw Water, Oil, Water and Soluble Oil

Size (NPTF)	Model Number	Cv		Max. Temp. (71°C)	Air Pressure On Top 30-40 psi (2.1-2.8 bar)
		Inlet to Cylinder	Cylinder to Drain		
1/2"	C204-2003	3.30	3.30	160°F (71°C)	30-40 psi (2.1-2.8 bar)
3/4"	C204-3003	3.60	3.60		



Basic Dimensions

Size (NPTF)	Model Number		A	B	C	D	E	F	G
1/2"	C204-2003	inch	7.25	1/4"	2.94	4.12	4.06	5.19	13.00
		mm	184	NPTF	75	105	103	132	330
3/4"	C204-3003	inch	7.25	1/4"	2.94	4.12	4.06	5.19	13.00
		mm	184	NPTF	75	105	103	132	330



Size (NPTF)	1/2"	3/4"	Description
Model Number	C204-2003	C204-3003	
Item Number	Part Number		
1	C093-028	C093-044	Body
• 2	H136-24	H136-24	O-Ring (2)
• 3	H143-21	H143-21	Back-Up Washer (4)
• 4	H135-51	H135-51	O-Ring (2)
• 5	H143-13	H143-13	Back-Up Washer (4)
6	D013-001	D013-001	Seat Sleeve
7	C332-012	C332-012	Stem Assembly
• 8	H135-11	H135-11	O-Ring (2)
• 9	H143-03	H143-03	Back-Up Washer (4)
10	D153-024	D153-024	Stud
11	D043-065	D043-065	Spacer
12	C213-050	C213-050	Bottom Cap
13	H060-23	H060-23	Hex. Nut
• 14	H092-02	H092-02	Wiper Ring (1)
• 15	D043-076	D043-076	Spacer (1)
• 16	H092-01	H092-01	Scraper Ring (1)

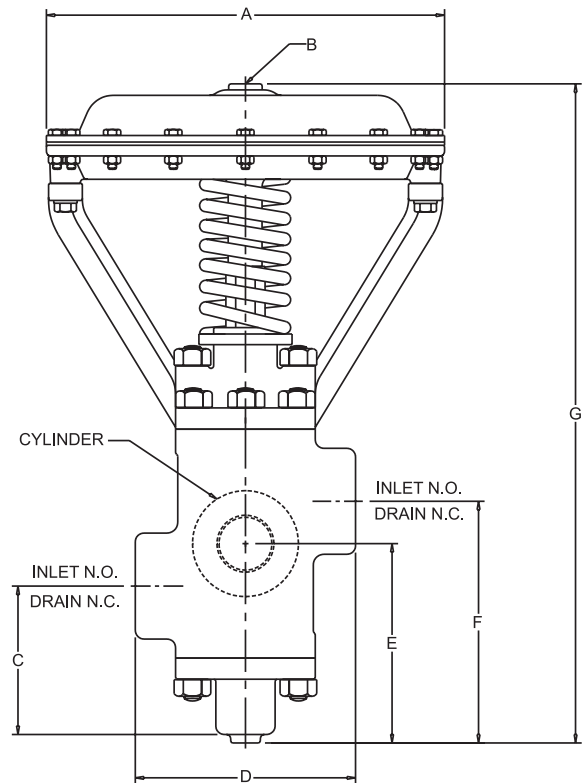
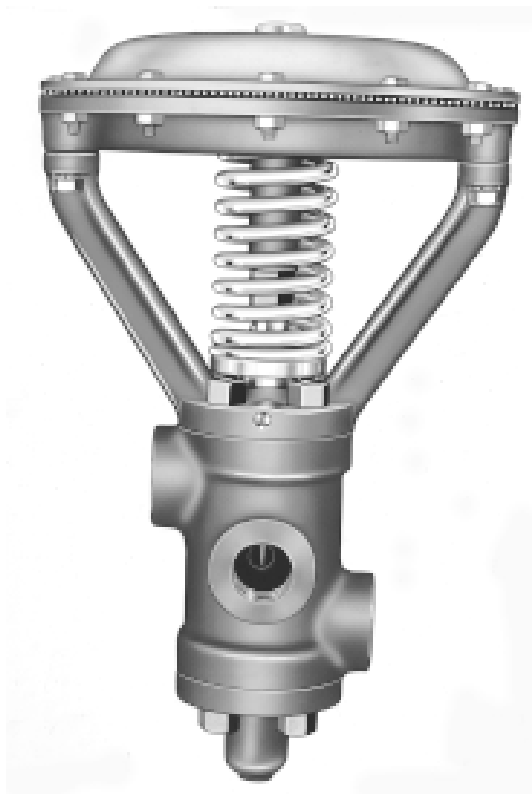
Size (NPTF)	1/2"	3/4"	Description
Model Number	C204-2003	C204-3003	
Item Number	Part Number		
• 17	H090-19	H090-19	Retaining Ring (1)
18	D283-020	D283-020	Yoke
19	D083-015	D083-015	Spring Seat
20	D293-037	D293-037	Spring
21	C633-016	C633-016	Spring Nut
22	C783-045	C783-045	Piston
23	H175-21	H175-21	Lock Washer
24	H096-56	H096-56	Cap Screw
25	C392-005	C392-005	Diaph. Top Ass'y.
26	C293-023	C293-023	Cover
27	C333-017	C333-017	Diaphragm
28	C893-014	C893-014	Ring
29	H096-10	H096-10	Cap Screw
30	H060-03	H060-03	Hex. Nut
	C182-040	C182-040	Seal Kit

• Included in Seal Kit.
 Note: When ordering parts, always specify valve size as well as description and part number.

4000 psi (275.8 bar) 3-Way, Tapped 1", 1-1/4", 1-1/2" & 2"

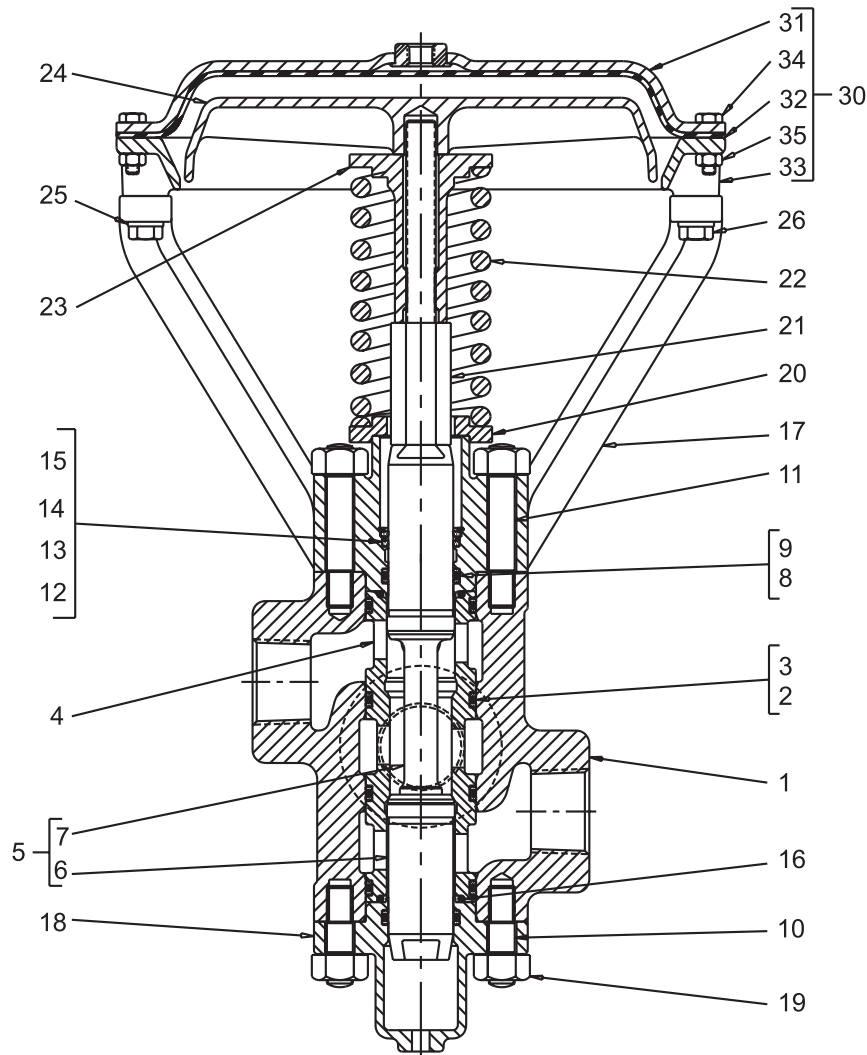
Media: Raw Water, Oil, Water and Soluble Oil

Size (NPTF)	Model Number	Cv		Max. Temp.	Air Pressure On Top
		Inlet to Cylinder	Cylinder to Drain		
1"	C204-4003	6.8	6.4	160°F (71°C)	30-40 psi (2.1-2.8 bar)
1-1/4"	C204-5003	11.0	10.2		
1-1/2"	C204-6003	14.8	14.8		
2"	C204-7003	29.0	29.0		



Basic Dimensions

Size (NPTF)	Model No.		A	B	C	D	E	F	G
1"	C204-4003	inch	9.50	1/4"	3.59	4.62	5.09	6.62	15.91
		mm	241	NPTF	91	117	129	168	404
1-1/4"	C204-5003	inch	10.50	1/4"	4.44	5.75	5.56	6.69	18.88
		mm	267	NPTF	113	146	141	170	480
1-1/2"	C204-6003	inch	11.75	1/4"	4.62	6.50	5.88	7.12	19.44
		mm	298	NPTF	117	165	149	181	494
2"	C204-7003	inch	13.12	1/4"	5.81	8.50	8.00	10.19	25.12
		mm	333	NPTF	148	216	203	259	638



Size (NPTF)	1"	1- 1/4"	1- 1/2"	2"	Description	Size (NPTF)	1"	1- 1/4"	1- 1/2"	2"	Description			
Model No.	C204-4003	C204-5003	C204-6003	C204-7003		Model No.	C204-4003	C204-5003	C204-6003	C204-7003		Model No.	C204-4003	C204-5003
Item No.	Part Number					Item No.	Part Number							
1	C093-063	C093-078	C093-097	C093-116	Body	17	D283-059	D283-065	D283-086	D283-104	Yoke			
• 2	H136-29	H137-07	H137-24	H137-55	O-Ring (3)	18	C213-051	C213-059	C213-062	C213-088	Bottom Cap			
• 3	H143-23	H143-26	H143-30	H143-39	Back-Up Wash. (6)	19	H060-23	H060-23	H060-23	C573-016	Hex. Nut			
4	D013-002	D013-006	D013-008	D013-009	Seat Sleeve	20	D083-023	D083-046	D083-045	-	Spring Seat			
5	C332-036	-	-	-	Stem Ass'y Items 6 & 7	21	D133-008	D133-009	D133-014	D133-020	Spring Stud			
6	D113-007	D113-011	D113-021	D113-032	Lower Stem	22	D293-043	D293-122	D293-126	D293-125	Spring			
7	D143-015	D143-028	D143-036	D143-046	Upper Stem	23	C633-017	C633-041	C633-040	C633-030	Spring Nut			
• 8	H135-31	H135-51	H136-24	H137-20	O-Ring (2)	24	C783-074	C783-086	C783-104	C783-113	Piston			
• 9	H143-09	H143-13	H143-21	H143-33	Back-Up Wash. (4)	25	H175-21	H175-21	H175-21	H175-21	Lock Washer			
10	D153-024	D153-024	D153-031	D153-061	Stud - Short	26	H096-48	H096-48	H096-49	H096-49	Cap Screw			
11	-	D153-044	D153-043	D153-076	Stud - Long	30	C392-006	C392-008	C392-009	C392-010	Top Assembly			
• 12	H092-32	H092-12	H092-18	H092-25	Wiper Ring (1)	31	C293-030	C293-032	C293-036	C293-042	Cover			
• 13	D043-080	D043-084	D043-092	D043-098	Spacer (1)	32	C333-024	C333-030	C333-031	C333-037	Diaphragm			
• 14	H092-05	H092-11	H092-16	H092-24	Scraper Ring (1)	33	C893-022	C893-027	C893-031	C893-037	Ring			
• 15	H090-22	H090-47	H090-49	H090-52	Retainer Ring (1)	34	H096-10	H096-10	H096-10	H096-10	Cap Screw			
• 16	H135-37	H136-17	H136-43	H137-36	O-Ring (2)	35	H060-03	H060-03	H060-03	H060-03	Hex. Nut			
							C182-041	C182-042	C182-043	C182-044	Seal Kit			

• Included in Seal Kit.

Note: When ordering parts, always specify valve size as well as description and part number.



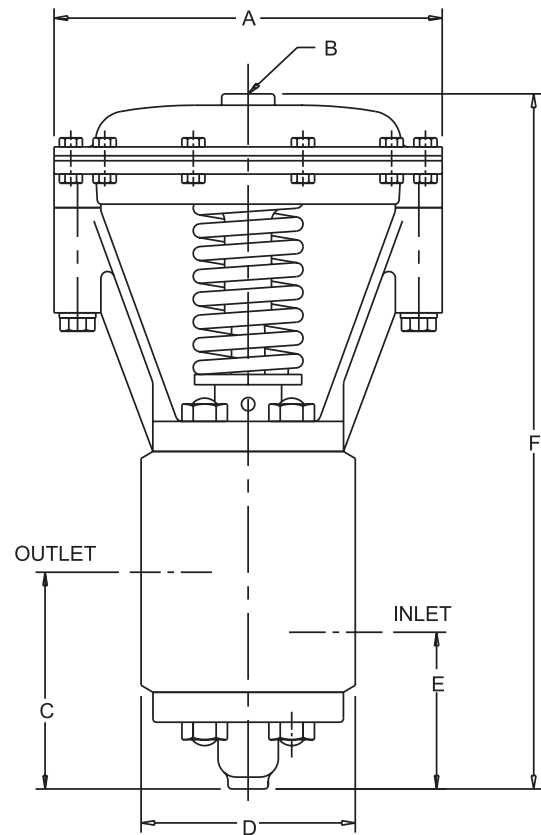
6000 psi (413.8 bar) 2-Way Normally Closed Tapped 1/2" & 3/4"

Media: Raw Water, Oil, Water and Soluble Oil

Size (NPTF)	Model Number	Cv	Max. Temp.	Air Pressure On Top
1/2"	C204-2004	2.65	160°F	35-40 psi
3/4"	C204-3004	2.7	(71°C)	(2.4-2.8 bar)

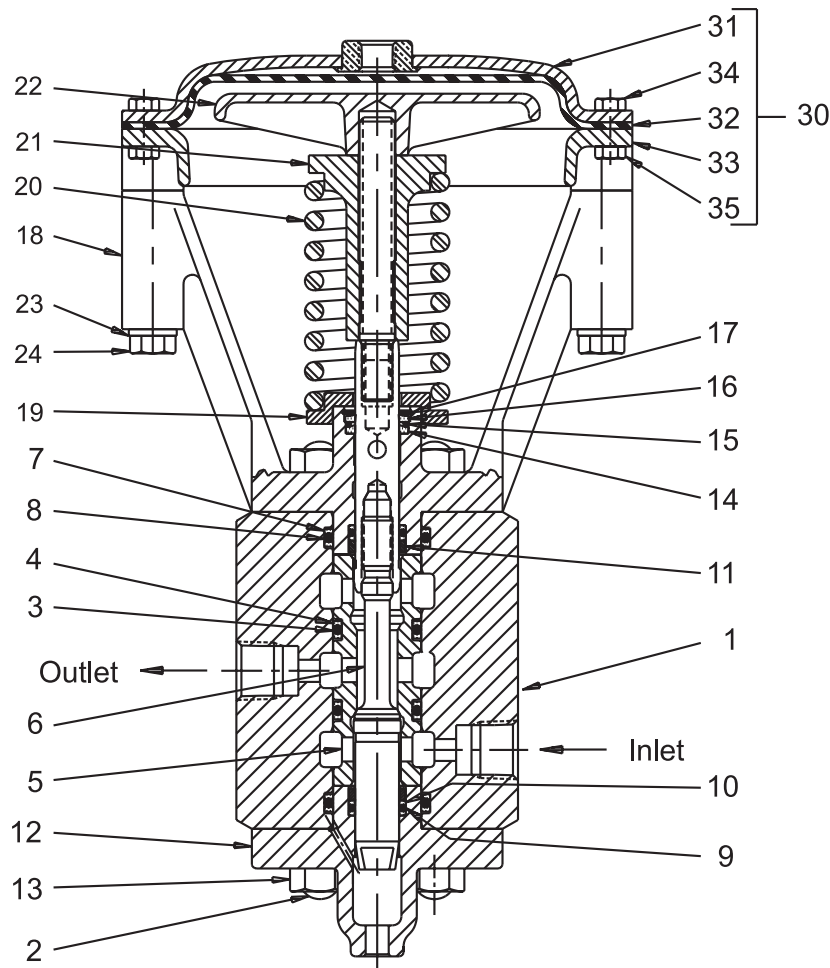
Installation

"Normally Closed" valves should be piped so that incoming fluid enters below the valve seat. For proper installation, the inlet must be connected to the pipe port nearest the bottom or cap end of the valve body.



Basic Dimensions

Size (NPTF)	Model Number		A	B	C	D	E	F
1/2"	C204-2004	inch	7.25	1/4"	4.06	4.12	2.94	13.00
		mm	184	NPTF	103	105	75	330
3/4"	C204-3004	inch	7.25	1/4"	4.06	4.12	2.94	13.00
		mm	184	NPTF	103	105	75	330



Size (NPTF)	1/2"	3/4"	Description
Model Number	C204-2004	C204-3004	
Item Number	Part Number		
1	C093-030	C093-045	Body
2	D153-024	D153-024	Stud
•3	H135-51	H135-51	O-Ring (2)
•4	H143-13	H143-13	Back-Up Washer (4)
5	D013-001	D013-001	Seat Sleeve
6	C332-012	C332-012	Stem Assembly
•7	H143-21	H143-21	Back-Up Washer (4)
•8	H136-24	H136-24	O-Ring (2)
•9	H135-11	H135-11	O-Ring (2)
•10	H143-03	H143-03	Back-Up Washer (4)
11	D043-065	D043-065	Spacer
12	C213-050	C213-050	Bottom Cap
13	H060-23	H060-23	Hex. Nut
•14	H092-02	H092-02	Wiper Ring (1)
•15	D043-076	D043-076	Spacer (1)
•16	H092-01	H092-01	Scraper Ring (1)

Size (NPTF)	1/2"	3/4"	Description
Model Number	C204-2004	C204-3004	
Item Number	Part Number		
•17	H090-19	H090-19	Retaining Ring (1)
18	D283-020	D283-020	Yoke
19	D083-015	D083-015	Spring Seat
20	D293-037	D293-037	Spring
21	C633-016	C633-016	Spring Nut
22	C783-045	C783-045	Piston
23	H175-21	H175-21	Lock Washer
24	H096-56	H096-56	Cap Screw
30	C392-005	C392-005	Diaph. Top Ass'y.
31	C293-023	C293-023	Cover
32	C333-017	C333-017	Diaphragm
33	C893-014	C893-014	Ring
34	H096-10	H096-10	Cap Screw
35	H060-03	H060-03	Hex. Nut
	C182-040	C182-040	Seal Kit

• Included in Seal Kit.

Note: When ordering parts, always specify valve size as well as description and part number.

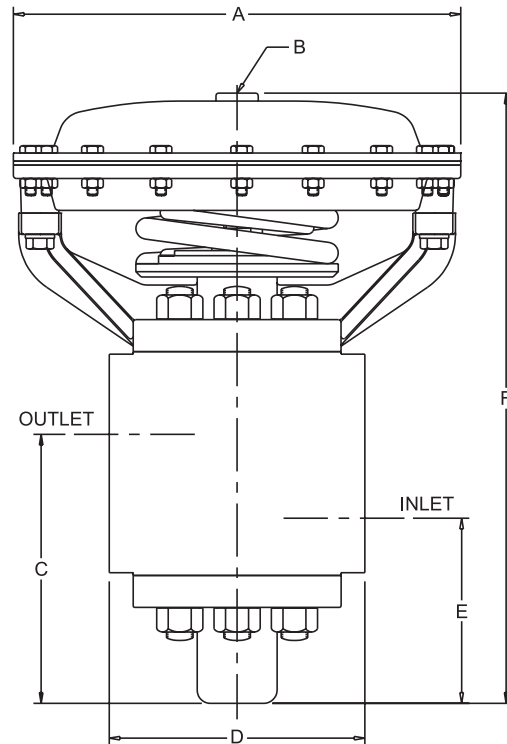
6000 psi (413.8 bar) 2-Way Normally Closed, Tapped 1", 1-1/4", 1-1/2" & 2"

Media: Raw Water, Oil, Water and Soluble Oil

Size (NPTF)	Model Number	Cv	Max. Temp.	Air Pressure On Top
1"	C204-4004	5.6	160°F (71°C)	35-40 psi (2.4-2.8 bar)
1-1/4"	C204-5004	10.2		
1-1/2"	C204-6004	15.3		
2"	C204-7004	23.8		

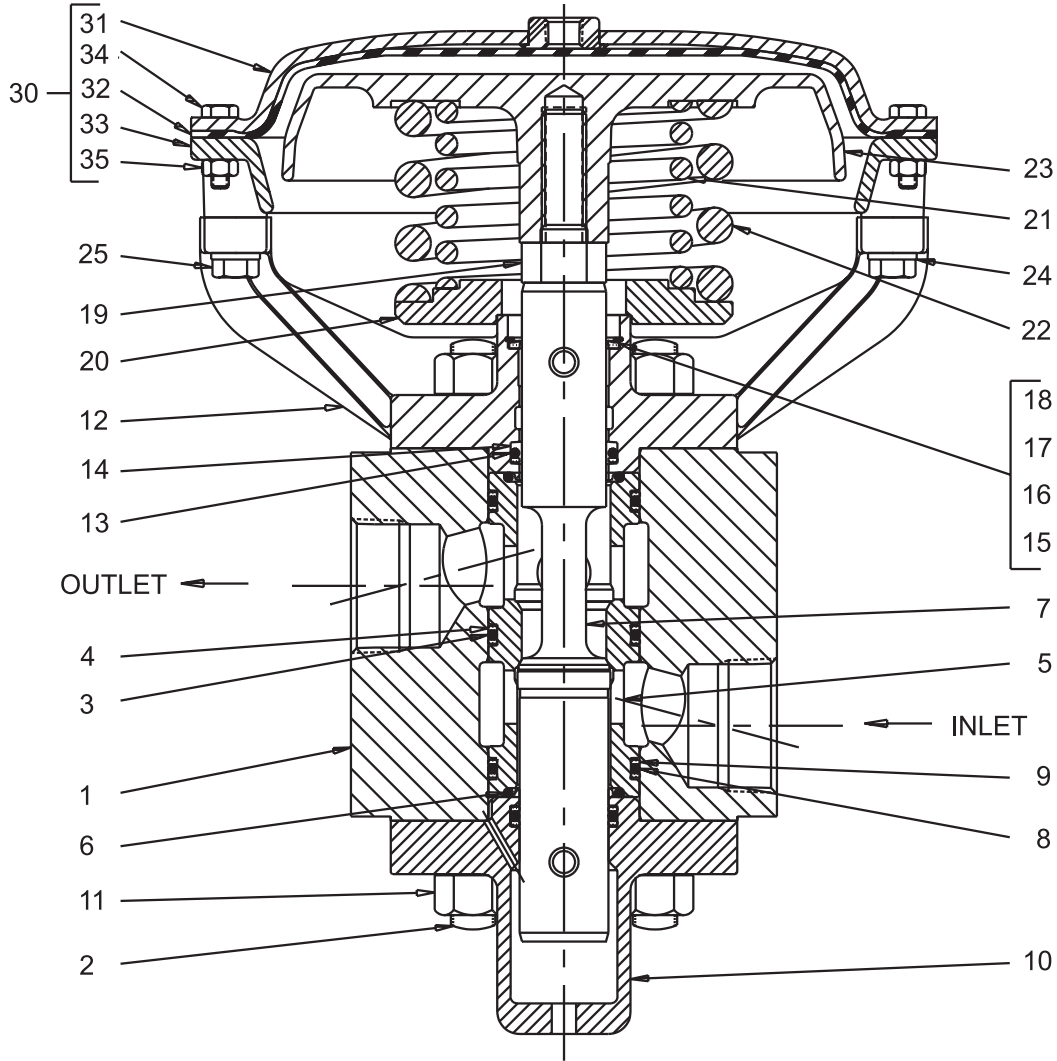
Installation

"Normally Closed" valves should be piped so that incoming fluid enters below the valve seat. For proper installation, the inlet must be connected to the pipe port nearest the bottom or cap end of the valve body.



Basic Dimensions

Size (NPTF)	Model Number		A	B	C	D	E	F
1"	C204-4004	inch	8.19	1/4"	5.28	4.50	4.16	12.47
		mm	208	NPTF	134	114	106	317
1-1/4"	C204-5004	inch	9.50	1/4"	5.19	5.75	4.06	12.28
		mm	241	NPTF	132	146	103	312
1-1/2"	C204-6004	inch	10.50	1/4"	6.31	6.00	4.94	15.19
		mm	267	NPTF	160	152	126	386
2"	C204-7004	inch	11.75	1/4"	7.56	7.62	5.50	16.31
		mm	298	NPTF	192	194	140	414



Size (NPTF)	1"	1- 1/4"	1- 1/2"	2"	Description	Size (NPTF)	1"	1- 1/4"	1- 1/2"	2"	Description
Model No.	C204-4004	C204-5004	C204-6004	C204-7004		Model No.	C204-4004	C204-5004	C204-6004	C204-7004	
Item No.	Part Number				Description	Item No.	Part Number				Description
1	C093-064	C093-079	C093-098	C093-117		Body	• 17	H092-03	H092-09	H092-14	
2	D153-024	D153-024	D153-061	D153-061	Stud	• 18	H090-22	H090-47	H090-49	H090-52	Retainer Ring (1)
• 3	H136-29	H137-07	H137-24	H137-55	O-Ring (3)	19	D133-047	D133-054	D133-060	D133-064	Spring Stud
• 4	H143-23	H143-26	H143-30	H143-39	Back-Up Wash.(6)	20	D083-035	D083-032	D083-037	D083-038	Spring Seat
5	D013-003	D013-005	D013-007	D013-010	Seat Sleeve	21	D293-022	D293-022	D293-038	D293-067	Inner Spring
• 6	H135-51	H136-17	H136-43	H137-36	O-Ring (2)	22	D293-039	D293-038	D293-035	D293-035	Outer Spring
7	D093-101	D093-124	D093-154	D093-178	Stem	23	C783-056	C783-078	C783-091	C783-097	Piston
• 8	H135-31	H135-51	H136-24	H137-20	O-Ring (1)	24	H175-21	H175-21	H175-21	H175-21	Lock Washer
• 9	H143-09	H143-13	H143-21	H143-33	Back-Up Wash.(2)	25	H096-52	H096-49	H096-48	H096-49	Cap Screw
10	C213-048	C213-056	C213-075	C213-082	Bottom Cap	30	C392-007	C392-006	C392-008	C392-009	Diaph. Top Ass'y.
11	H060-23	H060-23	C573-016	C573-016	Hex. Nut	31	C293-091	C293-030	C293-032	C293-036	Cover
12	D283-032	D283-056	D283-067	D283-089	Yoke	32	C333-022	C333-024	C333-030	C333-031	Diaphragm
• 13	H135-22	H135-41	H136-17	H239-22	O-Ring (1)	33	C893-048	C893-022	C893-027	C893-031	Ring
• 14	H143-06	H143-11	H143-19	H143-31	Back-Up Wash.(2)	34	H096-10	H096-10	H096-10	H096-10	Cap Screw
• 15	-	-	H092-15	H092-22	Wiper Ring (1)	35	H060-03	H060-03	H060-03	H060-03	Hex. Nut
• 16	-	-	D043-091	D043-098	Spacer (1)		C182-038	C182-034	C182-036	C182-033	Seal Kit

• Included in Seal Kit.

Note: When ordering parts, always specify valve size as well as description and part number.



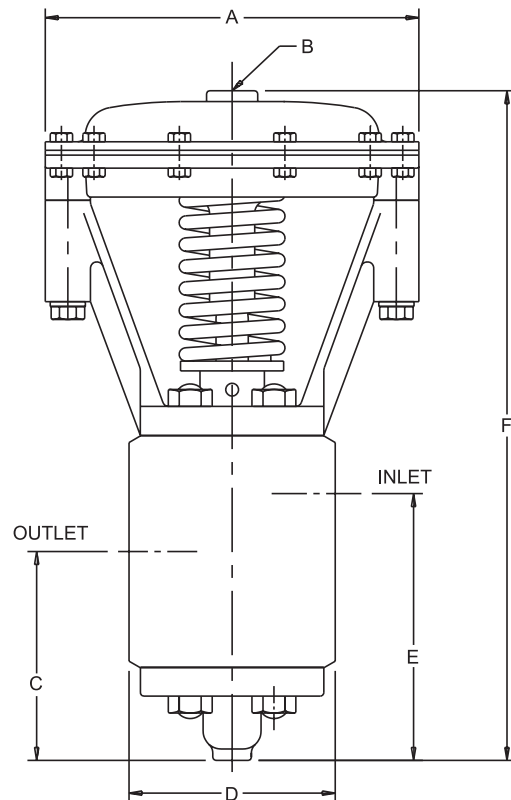
6000 psi (413.8 bar) 2-Way Normally Open, Tapped 1/2" & 3/4"

Media: Raw Water, Oil, Water and Soluble Oil

Size (NPTF)	Model Number	Cv	Max. Temp.	Air Pressure On Top
1/2"	C204-2005	2.65	160°F (71°C)	35-40 psi (2.4-2.8 bar)
3/4"	C204-3005	2.70		

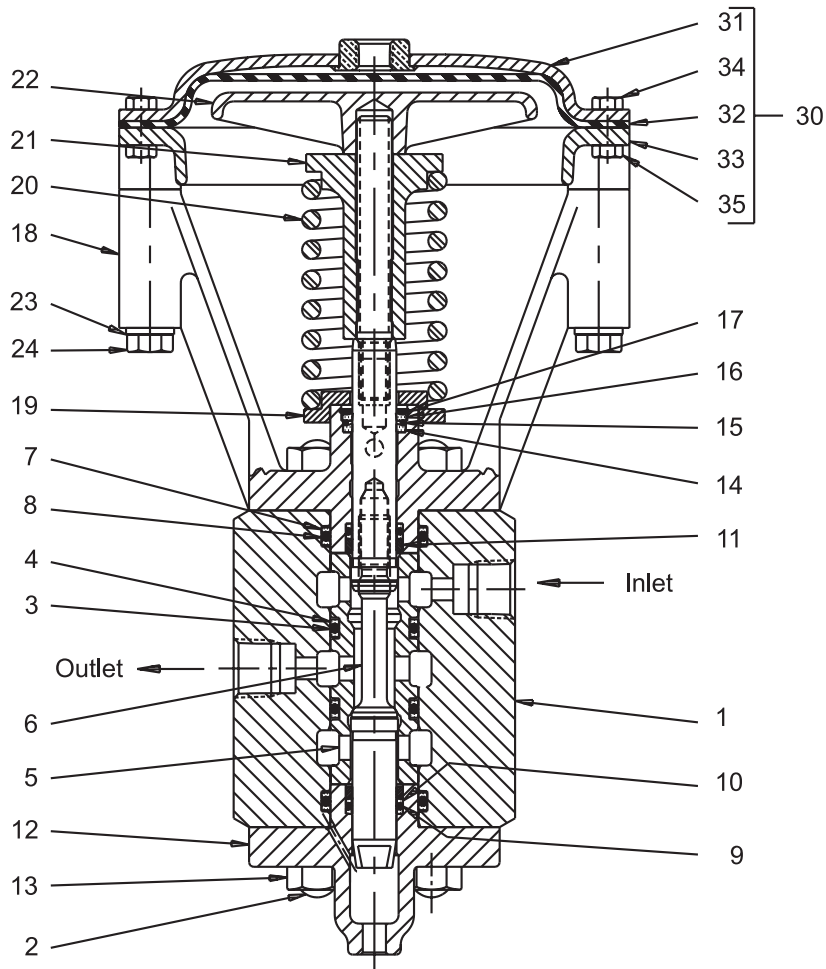
Installation

"Normally Open" valves should be piped so that incoming fluid enters above the valve seat. For proper installation, the inlet must be connected to the pipe port nearest the top or yoke end of the valve body.



Basic Dimensions

Size (NPTF)	Model Number		A	B	C	D	E	F
1/2"	C204-2005	inch	7.25	1/4"	4.06	4.12	5.19	13.00
		mm	184	NPTF	103	105	132	330
3/4"	C204-3005	inch	7.25	1/4"	4.06	4.12	5.19	13.00
		mm	184	NPTF	103	105	132	330



Size (NPTF)	1/2"	3/4"	Description
Model Number	C204-2005	C204-3005	
Item Number	Part Number		
1	C093-030	C093-045	Body
2	D153-024	D153-024	Stud
• 3	H135-51	H135-51	O-Ring (2)
• 4	H143-13	H143-13	Back-Up Washer (4)
5	D013-001	D013-001	Seat Sleeve
6	C332-012	C332-012	Stem Assembly
• 7	H143-21	H143-21	Back-Up Washer (4)
• 8	H136-24	H136-24	O-Ring (2)
• 9	H135-11	H135-11	O-Ring (2)
10	H143-03	H143-03	Back-Up Washer (4)
11	D043-065	D043-065	Spacer
12	C213-050	C213-050	Bottom Cap
13	H060-23	H060-23	Hex. Nut
• 14	H092-02	H092-02	Wiper Ring (1)
• 15	D043-076	D043-076	Spacer (1)
• 16	H092-01	H092-01	Scraper Ring (1)

Size (NPTF)	1/2"	3/4"	Description
Model Number	C204-2005	C204-3005	
Item Number	Part Number		
• 17	H090-19	H090-19	Retaining Ring (1)
18	D283-020	D283-020	Yoke
19	D083-015	D083-015	Spring Seat
20	D293-037	D293-037	Spring
21	C633-016	C633-016	Spring Nut
22	C783-045	C783-045	Piston
23	H175-21	H175-21	Lock Washer
24	H096-56	H096-56	Cap Screw
30	C392-005	C392-005	Diaph. Top Ass'y.
31	C293-023	C293-023	Cover
32	C333-017	C333-017	Diaphragm
33	C893-014	C893-014	Ring
34	H096-10	H096-10	Cap Screw
35	H060-03	H060-03	Hex. Nut
	C182-040	C182-040	Seal Kit

• Included In Seal Kit

Note: When ordering parts, always specify valve size as well as description and part number.

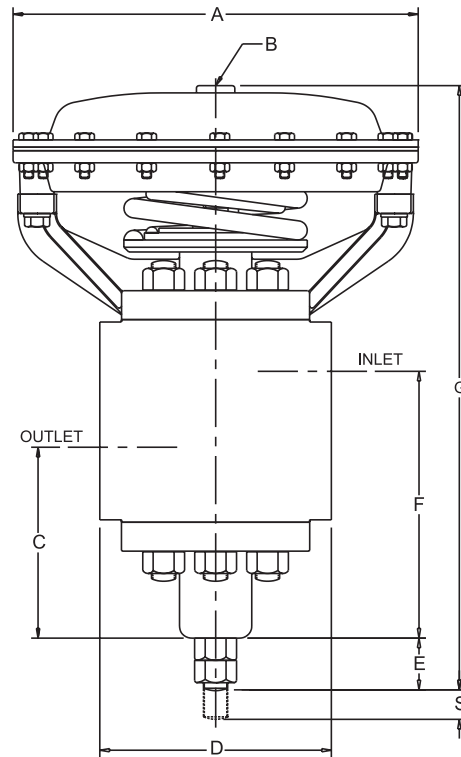
6000 psi (413.8 bar) 2-Way Normally Open, Tapped 1, 1-1/4", 1-1/2" & 2"

Media: Raw Water, Oil, Water and Soluble Oil

Size (NPTF)	Model Number	Cv	Maximum Temp.	Air Pressure On Top
1"	C204-4005	6.4	160°F (71°C)	35-40 psi (2.4-2.8 bar)
1-1/4"	C204-5005	11.0		
1-1/2"	C204-6005	16.0		
2"	C204-7005	23.3		

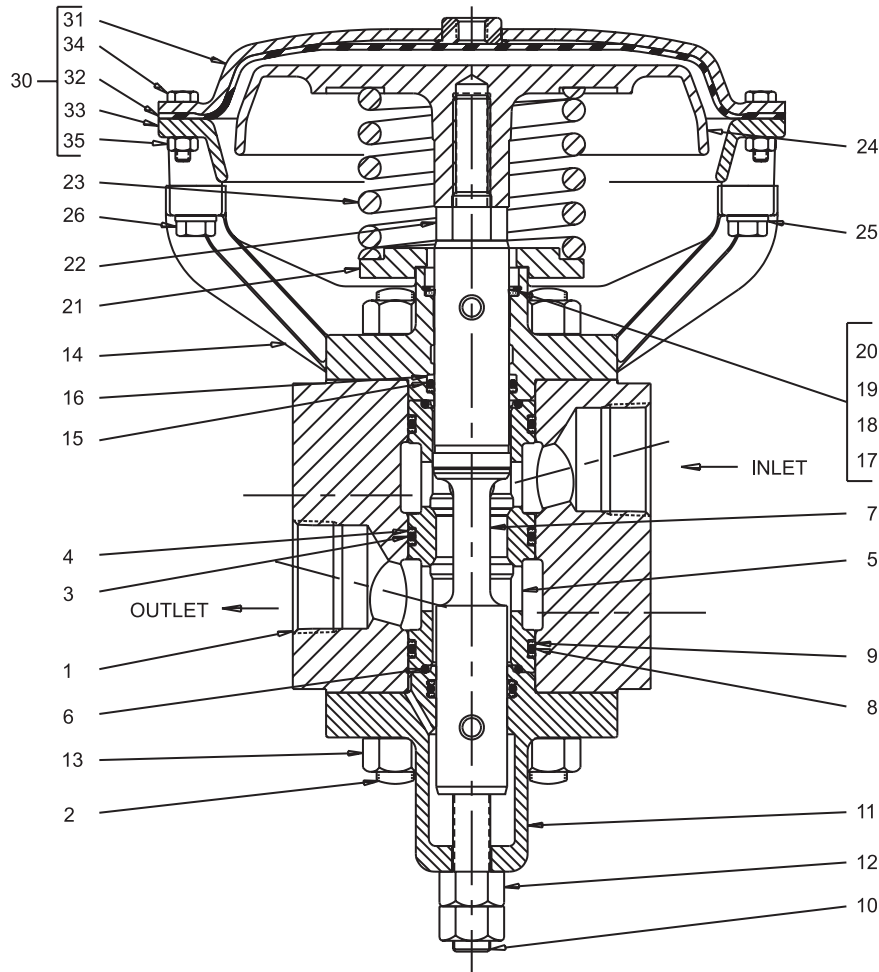
Installation

"Normally Open" valves should be piped so that incoming fluid enters above the valve seat. For proper installation, the inlet must be connected to the pipe port nearest the top or yoke end of the valve body.



Basic Dimensions

Size (NPTF)	Model No.		A	B	C	D	E	F	G	S
1"	C204-4005	inch	8.19	1/4"	4.16	4.50	1.00	5.28	13.47	0.47
		mm	208	NPTF	106	114	25	134	342	12
1-1/4"	C204-5005	inch	9.50	1/4"	4.06	5.75	1.19	5.19	13.47	0.50
		mm	241	NPTF	103	146	30	132	342	13
1-1/2"	C204-6005	inch	10.50	1/4"	4.94	6.00	1.44	6.31	16.62	0.53
		mm	267	NPTF	126	152	37	160	422	13
2"	C204-7005	inch	11.75	1/4"	5.50	7.62	1.69	7.56	18.00	0.84
		mm	298	NPTF	140	194	43	192	457	21



Size (NPTF)	1"	1-1/4"	1-1/2"	2"	Description
Model No.	C204-4005	C204-5005	C204-6005	C204-7005	
Item No.	Part Number				
1	C093-064	C093-079	C093-098	C093-117	Body
2	D153-024	D153-024	D153-061	D153-061	Stud
• 3	H136-29	H137-07	H137-24	H137-55	O-Ring (3)
• 4	H143-23	H143-26	H143-30	H143-39	Back-Up Wash.(6)
5	D013-003	D013-005	D013-007	D013-010	Seat Sleeve
• 6	H135-51	H136-17	H136-43	H137-36	O-Ring (2)
7	D093-101	D093-124	D093-154	D093-178	Stem
• 8	H135-22	H135-41	H136-17	H239-22	O-Ring (1)
• 9	H143-06	H143-11	H143-19	H143-31	Back-Up Wash.(2)
10	D153-017	D153-074	D153-073	D153-085	Adjusting Screw
11	C213-049	C213-057	C213-076	C213-084	Bottom Cap
12	H060-15	H060-23	C573-016	C573-021	Adjusting Nut
13	H060-23	H060-23	C573-016	C573-016	Hex. Nut
14	D283-030	D283-048	D283-074	D283-088	Yoke
• 15	H135-31	H135-51	H136-24	H137-20	O-Ring (1)
• 16	H143-09	H143-13	H143-21	H143-33	Back-Up Wash.(2)
• 17	-	-	-	H092-25	Wiper Ring (1)

Size (NPTF)	1"	1-1/4"	1-1/2"	2"	Description
Model No.	C204-4005	C204-5005	C204-6005	C204-7005	
Item No.	Part Number				
• 18	-	-	-	D043-098	Spacer (1)
• 19	H092-05	H092-11	H092-16	H092-24	Scraper Ring (1)
• 20	H090-22	H090-47	H090-49	H090-52	Retainer Ring (1)
21	D083-011	D083-018	D083-034	D083-038	Spring Seat
22	D133-011	D133-014	D133-043	D133-055	Spring Stud
23	D293-028	D293-028	D293-032	D293-035	Spring
24	C783-056	C783-078	C783-091	C783-097	Piston
25	H175-21	H175-21	H175-21	H175-21	Lock Washer
26	H096-52	H096-49	H096-48	H096-49	Cap Screw
30	C392-007	C392-006	C392-008	C392-009	Diaph. Top Ass'y.
31	C293-091	C293-030	C293-032	C293-036	Cover
32	C333-022	C333-024	C333-030	C333-031	Diaphragm
33	C893-048	C893-022	C893-027	C893-031	Ring
34	H096-10	H096-10	H096-10	H096-10	Cap Screw
35	H060-03	H060-03	H060-03	H060-03	Hex. Nut
	C182-039	C182-035	C182-037	C182-032	Seal Kit

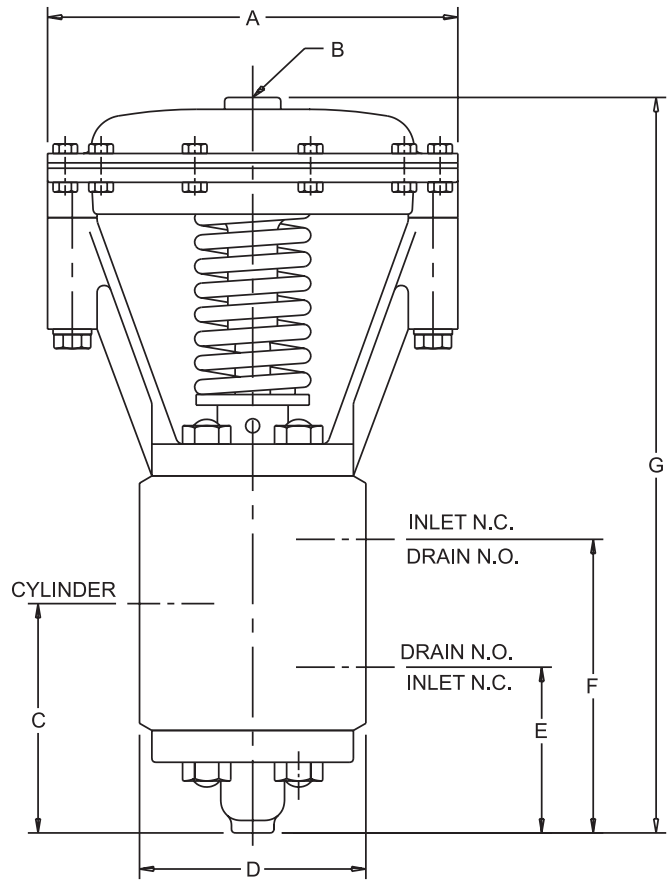
• Included in Seal Kit.

Note: When ordering parts, always specify valve size as well as description and part number.

6000 psi (413.8 bar) 3-Way Tapped 1/2" & 3/4"

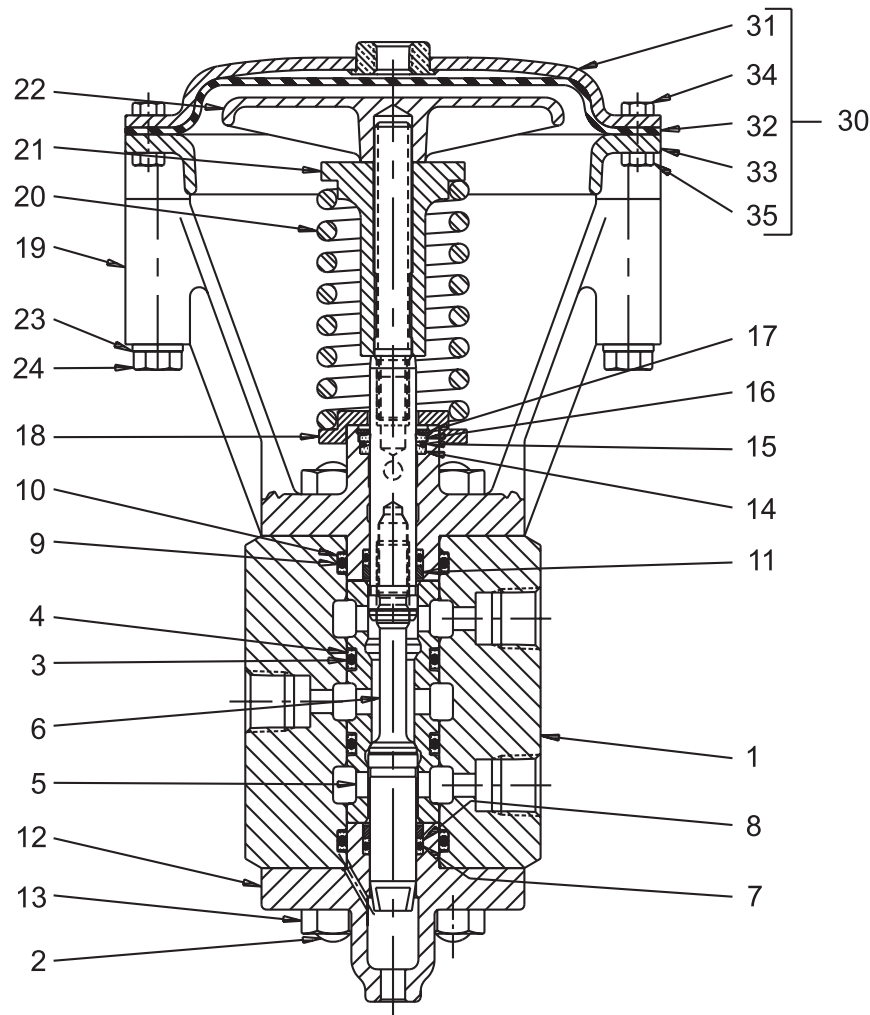
Media: Raw Water, Oil, Water and Soluble Oil

Size (NPTF)	Model Number	Cv		Maximum Temp.	Air Pressure On Top
		Inlet to Cylinder	Cylinder to Drain		
1/2"	C204-2006	2.80	2.80	160°F	35-40 psi
3/4"	C204-3006	2.80	2.80	(71°C)	(2.4-2.8 bar)



Basic Dimensions

Size (NPTF)	Model Number		A	B	C	D	E	F	G
1/2"	C204-2006	inch	7.25	1/4"	4.06	4.12	2.94	5.19	13.00
		mm	184	NPTF	103	105	75	132	330
3/4"	C204-3006	inch	7.25	1/4"	4.06	4.12	2.94	5.19	13.00
		mm	184	NPTF	103	105	75	132	330



Size (NPTF)	1/2"	3/4"	Description
Model No.	C204-2006	C204-3006	
Item No.	Part Number		
1	C093-031	C093-046	Body
2	D153-024	D153-024	Stud
• 3	H135-51	H135-51	O-Ring (2)
• 4	H143-13	H143-13	Back-Up Washer (4)
5	D013-001	D013-001	Seat Sleeve
6	C332-012	C332-012	Stem Assembly
• 7	H135-11	H135-11	O-Ring (2)
• 8	H143-03	H143-03	Back-Up Washer (4)
• 9	H136-24	H136-24	O-Ring (2)
10	H143-21	H143-21	Back-Up Washer (4)
11	D043-065	D043-065	Spacer
12	C213-050	C213-050	Bottom Cap
13	H060-23	H060-23	Hex. Nut
• 14	H092-02	H092-02	Wiper Ring (1)
• 15	D043-076	D043-076	Spacer (1)
• 16	H092-01	H092-01	Scraper Ring (1)

Size (NPTF)	1/2"	3/4"	Description
Model No.	C204-2006	C204-3006	
Item No.	Part Number		
• 17	H090-19	H090-19	Retaining Ring (1)
18	D083-015	D083-015	Spring Seat
19	D283-020	D283-020	Yoke
20	D293-037	D293-037	Spring
21	C633-016	C633-016	Spring Nut
22	C783-045	C783-045	Piston
23	H175-21	H175-21	Lock Washer
24	H096-56	H096-56	Cap Screw
30	C392-005	C392-005	Diaph. Top Ass'y.
31	C293-023	C293-023	Cover
32	C333-017	C333-017	Diaphragm
33	C893-014	C893-014	Ring
34	H096-10	H096-10	Cap Screw
35	H060-03	H060-03	Hex. Nut
	C182-040	C182-040	Seal Kit

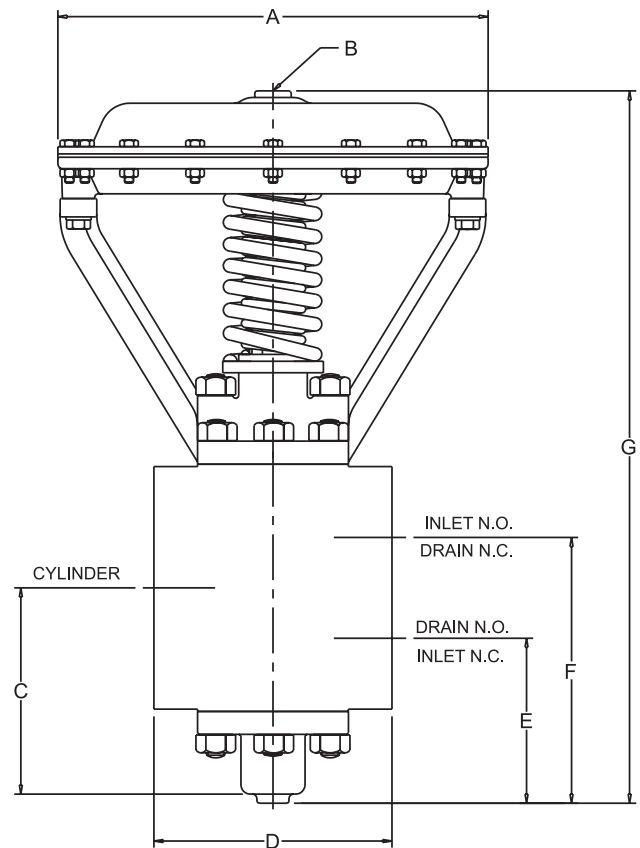
• Included in Seal Kit.

Note: When ordering parts, always specify valve size as well as description and part number.

6000 psi (413.8 bar) 3-Way, Tapped 1", 1-1/4", 1-1/2" & 2"

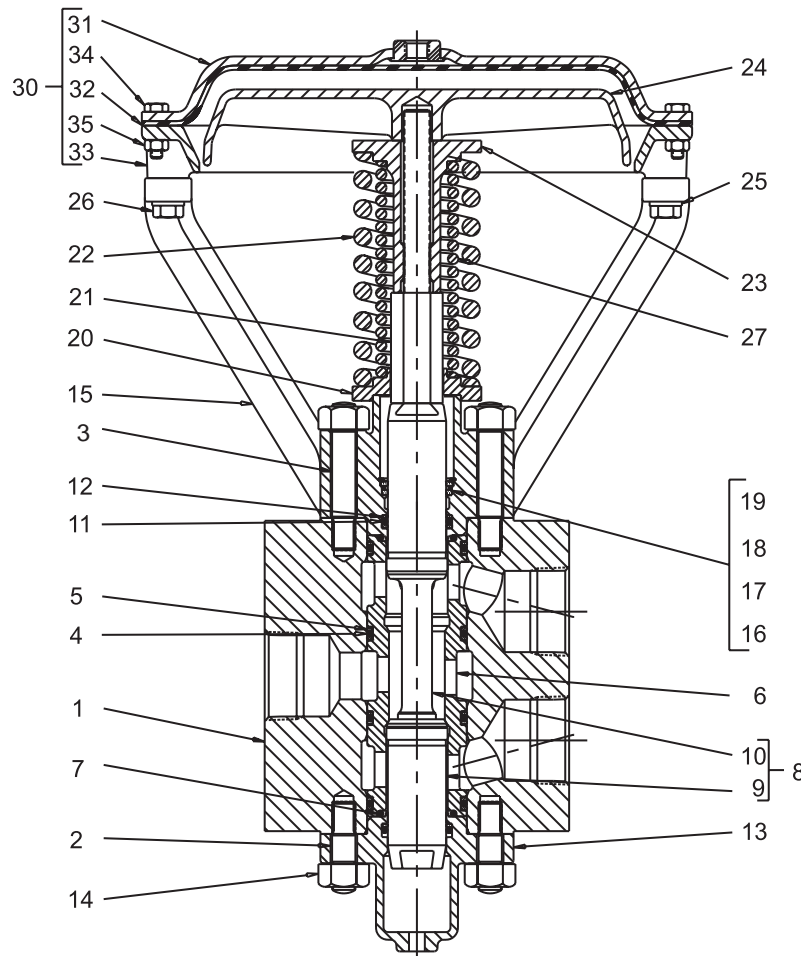
Media: Raw Water, Oil, Water and Soluble Oil

Size (NPTF)	Model Number	Cv		Max. Temp.	Air Pressure On Top
		Inlet to Cylinder	Cylinder to Drain		
1"	C204-4006	5.1	4.8	160°F (71°C)	35-40 psi (2.4-2.8 bar)
1-1/4"	C204-5006	10.2	9.5		
1-1/2"	C204-6006	13.5	13.5		
2"	C204-7006	27.0	28.5		



Basic Dimensions

Size (NPTF)	Model No.		A	B	C	D	E	F	G
1"	C204-4006	inch	9.50	1/4"	5.09	4.62	3.59	6.59	15.91
		mm	241	NPTF	129	117	91	167	404
1-1/4"	C204-5006	inch	10.50	1/4"	5.56	5.75	4.31	6.81	18.88
		mm	267	NPTF	141	146	109	173	480
1-1/2"	C204-6006	inch	11.75	1/4"	5.88	6.50	4.50	7.25	19.44
		mm	298	NPTF	149	165	114	184	494
2"	C204-7006	inch	13.12	1/4"	8.00	8.50	5.81	10.19	25.09
		mm	333	NPTF	203	216	148	259	637



Size (NPTF)	1"	1-1/4"	1-1/2"	2"	Description
Model No.	C204-4006	C204-5006	C204-6006	C204-7006	
Item No.	Part Number				
1	C093-065	C093-080	C093-099	C093-118	Body
2	D153-035	D153-024	D153-031	D153-061	Stud
3	-	D153-044	D153-043	D153-076	Stud
• 4	H136-29	H137-07	H137-24	H137-55	O-Ring (4)
• 5	H143-23	H143-26	H143-30	H143-39	Back-Up Washer (8)
6	D013-002	D013-006	D013-008	D013-009	Seat Sleeve
• 7	H135-37	H136-17	H136-43	H137-36	O-Ring (2)
8	C332-036	-	-	-	Stem Assembly Parts 9, 10
9	D113-007	D113-011	D113-021	D113-032	Lower Stem
10	D143-015	D143-028	D143-036	D143-046	Upper Stem
• 11	H135-31	H135-51	H136-24	H137-20	O-Ring (2)
• 12	H143-09	H143-13	H143-21	H143-33	Back-Up Washer (4)
13	C213-051	C213-059	C213-062	C213-088	Bottom Cap
14	H060-23	H060-23	H060-23	C573-016	Hex. Nut
15	D283-059	D283-065	D283-086	D283-104	Yoke
• 16	H092-32	H092-12	H092-18	H092-25	Wiper Ring (1)
• 17	D043-080	D043-084	D043-092	D043-098	Spacer (1)

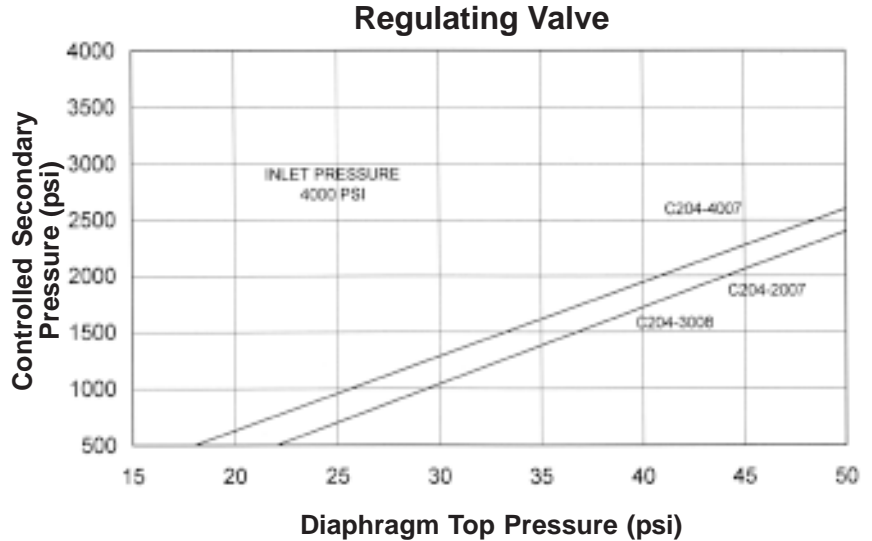
Size (NPTF)	1"	1-1/4"	1-1/2"	2"	Description
Model No.	C204-4006	C204-5006	C204-6006	C204-7006	
Item No.	Part Number				
• 18	H092-05	H092-11	H092-16	H092-24	Scraper Ring (1)
• 19	H090-22	H090-47	H090-49	H090-52	Retainer Ring (1)
20	D083-043	D083-044	D083-042	-	Spring Seat
21	D133-008	D133-009	D913-014	D133-020	Spring Stud
22	D293-043	D293-122	D293-126	D293-125	Outer Spring
23	C683-017	C683-041	C683-040	C683-030	Spring Nut
24	C783-074	C783-086	C783-104	C783-113	Piston
25	H175-21	H175-21	H175-21	H175-21	Lock Washer
26	H096-48	H096-48	H096-49	H096-49	Cap Screw
27	D293-123	D293-123	D293-124	-	Inner Spring
30	C392-006	C392-008	C392-009	C392-010	Diaph. Top Ass'y.
31	C293-030	C293-032	C293-036	C293-042	Cover
32	C333-024	C333-030	C333-031	C333-037	Diaphragm
33	C893-022	C893-027	C893-031	C893-037	Ring
34	H096-10	H096-10	H096-10	H096-12	Cap Screw
35	H060-03	H060-03	H060-03	H060-03	Hex. Nut
	C182-041	C182-042	C182-043	C182-044	Seal Kit

• Included in Seal Kit.

Note: When ordering parts, always specify valve size as well as description and part number.

4000 psi (275.8 bar) Pressure Regulating, Tapped 1/2", 3/4" & 1"

Media: Raw Water, Oil, Water and Soluble Oil



Description

These valves are unique adaptations of our 2-Way 4000 psi (275.8 bar), diaphragm operated valves. They are intended for use on compatible liquid service at temperatures to 160°F (71°C) where remotely controllable setpoints are desirable. Raw water, soluble oil and water, petroleum based oils, glycols and glycerols, cutting oils, vegetable oils and most paints are typical fluids; others may be accommodated by special seals. The same drip-tight sealing, high-quality construction and long term performance for which Sinclair Collins® products are known, are evidenced in these valves.

Features

Pressure Regulating valves have 4000 psi (275.8 bar) maximum input ratings. As shown on the control curves, above, the Pressure Regulating valve will provide and maintain an output or secondary pressure at a selected magnitude below that of the input or primary pressure in response to the level of the Diaphragm Top signal pressure. **With the Pressure Regulating valve, 30-40 cm³/min bleed is required in the secondary circuit.**

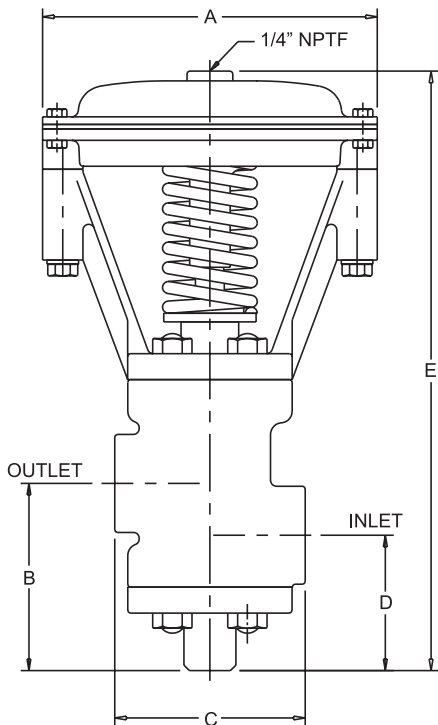
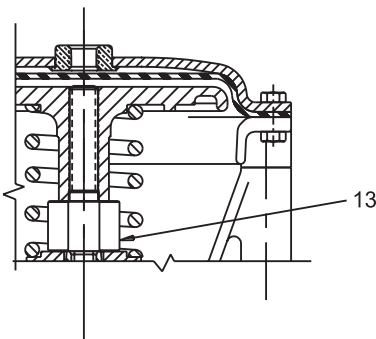
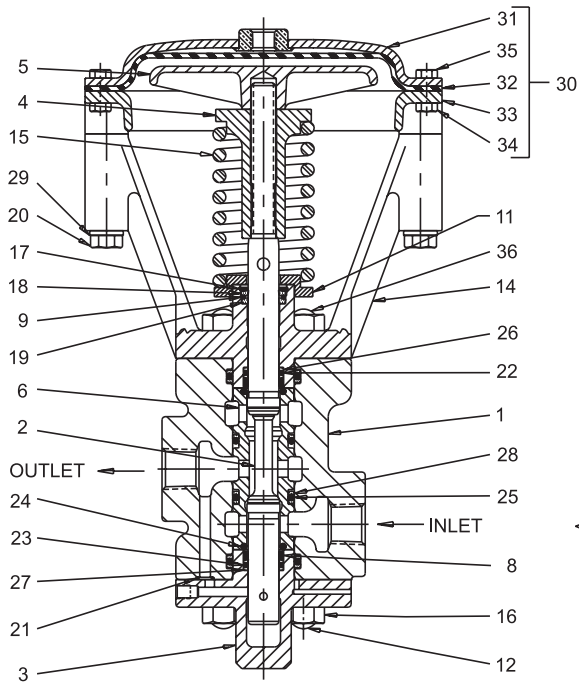
Engineering Data

Valve stems are hardened stainless steel. Stem alignment is assured by the bearing guides in the bore. The valve body material is ASTM-B61 bronze. Standard seals are nitrile base rubber.

How To Order

Select and order the model numbers from the following table to suit the type of service and pipe size requirements.

Size (NPTF)	Model Number Regulating Valve
1/2"	C204-2007
3/4"	C204-3008
1"	C204-4007



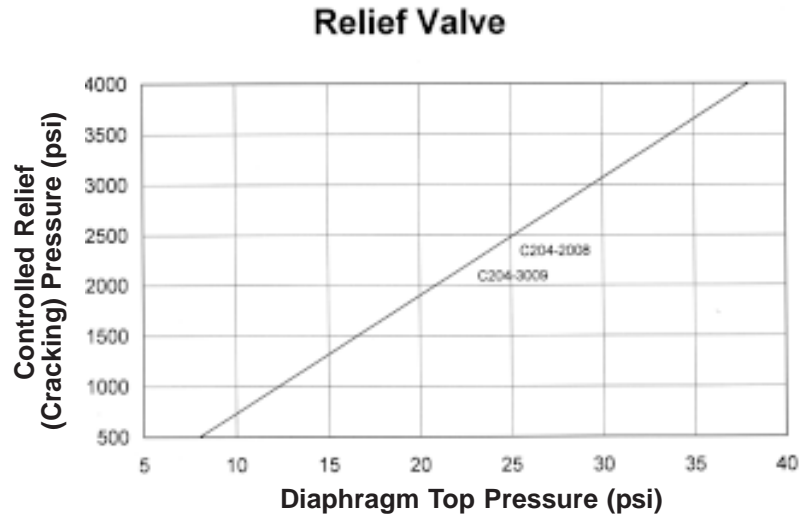
Size (NPTF)	1/2"	3/4"	1"	Description
Model No.	C204-2007	C204-3008	C204-4007	
Item No.	Part Number			
1	C093-281	C093-282	C093-283	Body
2	C332-012	C332-012	D093-101	Stem
3	C442-003	C442-003	C442-004	Bottom Cap
4	C633-016	C633-016	-	Spring Nut
5	C783-045	C783-045	C783-056	Piston
6	D013-001	D013-001	D013-003	Seat Sleeve
8	D043-065	D043-065	-	Spacer
9	D043-076	D043-076	-	Spacer
11	D083-015	D083-015	D083-012	Spring Seat
12	D153-024	D153-024	D153-107	Stud
13	-	-	D133-047	Stem Stud
14	D283-020	D283-020	D283-032	Yoke
15	D293-037	D293-037	C293-022	Spring
16	H060-23	H060-23	H060-23	Hex Nut
17	H090-19	H090-19	H090-22	Retaining Ring
18	H092-01	H092-01	H092-03	Scraper Ring
19	H092-02	H092-02	-	Wiper Ring
20	H096-56	H096-56	H096-52	Cap Screw
21	H134-18	H134-18	H134-18	O-Ring
22	H135-11	H135-11	H135-22	O-Ring
23	-	-	H135-31	O-Ring
24	H135-51	H135-51	H135-51	O-Ring
25	H136-24	H136-24	H136-29	O-Ring
26	H143-03	H143-03	H143-06	Back-Up Washer
27	H143-13	H143-13	H143-09	Back-Up Washer
28	H143-21	H143-21	H143-23	Back-Up Washer
29	H175-21	H175-21	H175-21	Lock Washer
30	C392-005	C392-005	C392-007	Diaphragm Top
31	C293-023	C293-023	C293-091	Cover
32	C333-017	C333-017	C333-022	Diaphragm
33	C893-014	C893-014	C893-048	Ring
34	H060-03	H060-03	H060-03	Hex Nut
35	H096-10	H096-10	H096-10	Cap Screw
36	-	-	D153-024	Stud

Basic Dimensions

Size (NPTF)	Model Number		A	B	C	D	E
1/2"	C204-2007	inch	7.25	4.06	4.12	2.94	12.03
		mm	184	103	105	75	306
3/4"	C204-3008	inch	7.25	4.06	4.12	2.94	12.03
		mm	184	103	105	75	306
1"	C204-4007	inch	8.19	5.28	4.62	4.16	12.47
		mm	208	134	117	106	317

4000 psi (275.8 bar) Pressure Relief Tapped 1/2" & 3/4"

Media: Raw Water, Oil, Water and Soluble Oil



Description

These valves are unique adaptations of our 2-Way 4000 psi (275.8 bar), diaphragm operated valves. They are intended for use on compatible liquid service at temperatures to 160° F (71°C) where remotely control-able setpoints are desirable. Raw water, soluble oil and water, petroleum based oils, glycols and glycerols, cutting oils, vegetable oils and most paints are typical fluids; others may be accommodated by special seals. The same drip-tight sealing, high-quality construction and long term performance for which Sinclair Collins® products are known, are evidenced in these valves.

Features

The Pressure Relief valve will vary the set-point at which the system pressure will be relieved depending on the magnitude of the Diaphragm Top signal pressure. In this the means of adjusting the Diaphragm Top pressure can be remote from the main valve; this pressure should not exceed 40 psi (2.8 bar).

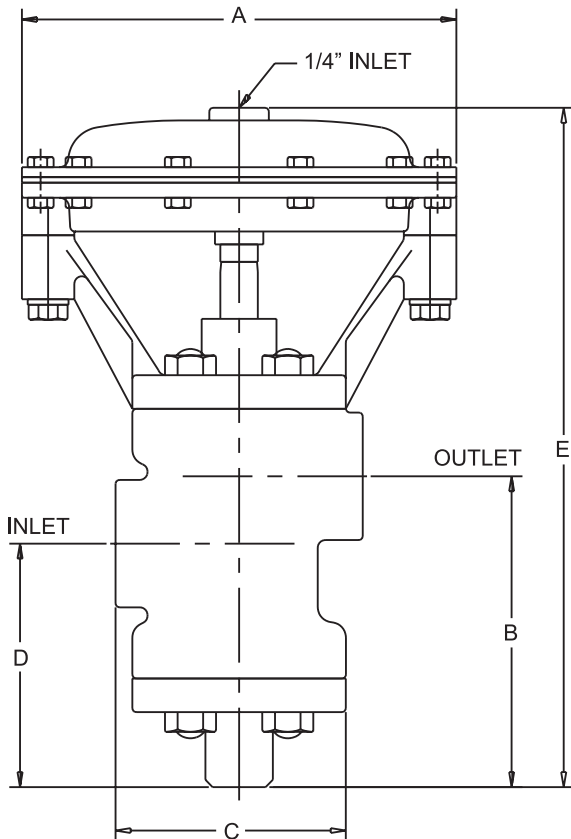
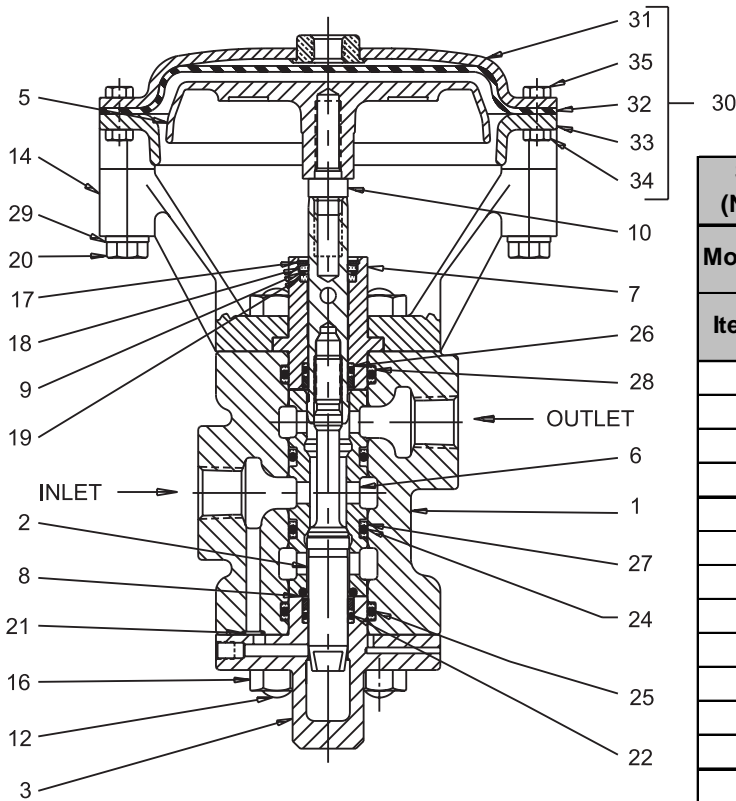
Engineering Data

Valve stems are hardened stainless steel. Stem alignment is assured by the bearing guides in the bore. The valve body material is ASTM-B61 bronze. Standard seals are nitrile base rubber.

How To Order

Select and order the model numbers from the following table to suit the type of service and pipe size requirements.

Size (NPTF)	Model Number Relief Valve
1/2"	C204-2008
3/4"	C204-3009
1"	(advise needs)



Size (NPTF)	1/2"	3/4"	Description
Model No.	C204-2008	C204-3009	
Item No.	Part Number		
1	C093-285	C093-284	Body
2	C332-089	C332-089	Stem
3	C442-003	C442-003	Bottom Cap
5	C783-056	C783-056	Piston
6	D013-001	D013-001	Seat Sleeve
7	D033-019	D033-019	Sleeve
8	D043-065	D043-065	Spacer
9	D043-076	D043-076	Spacer
10	D043-118	D043-118	Spacer
12	D153-024	D153-024	Stud
14	D283-188	D283-188	Yoke
16	H060-23	H060-23	Hex. Nut
17	H090-19	H090-19	Retaining Ring
18	H092-01	H092-01	Scraper Ring
19	H092-02	H092-02	Wiper Ring
20	H096-52	H096-52	Cap Screw
21	H134-18	H134-18	O-Ring
22	H135-11	H135-11	O-Ring
24	H135-51	H135-51	O-Ring
25	H136-24	H136-24	O-Ring
26	H143-03	H143-03	Back-Up Washer
27	H143-13	H143-13	Back-Up Washer
28	H143-21	H143-21	Back-Up Washer
29	H175-21	H175-21	Lock Washer
30	C392-007	C392-007	Diaphragm Top
31	C293-091	C293-091	Cover
32	C333-022	C333-022	Diaphragm
33	C893-048	C893-048	Ring
34	H060-03	H060-03	Hex. Nut
35	H096-10	H096-10	Cap Screw

Basic Dimensions

Size (NPTF)	Model Number		A	B	C	D	E
1/2"	C204-2008	in.	8.19	5.19	4.12	4.06	11.72
		mm	208	132	105	103	298
3/4"	C204-3009	in.	8.19	5.19	4.12	4.06	11.72
		mm	208	132	105	103	298

4000 psi (275.8 bar) Check Valves Tapped 1/2", 3/4", 1", 1-1/4", 1-1/2", 2" & 3"

Media: Raw Water, Oil, Water and Soluble Oil

Description

The Sinclair Collins® 4000 psi (275.8 bar) Check Valve contains the same parts and operates in the same manner as the low pressure inlet portion of our two-pressure hydraulic valve. It serves to admit low pressure liquid and backchecks to prevent passage of high pressure liquid. In function, the valve permits flow in one direction and prevents flow in the reverse direction.

Features

As an individual check valve it provides the same reliability and performance with the utility of being able to be applied at any convenient location in a circuit where a quality, trouble-free check valve is required.

The body material is a high quality bronze casting to ASTM B-61 specification, as is the seat retainer, but, in addition, its threads are chrome plated to facilitate disassembly. The springs are 302 S.S. to resist corrosion. For the same reason, all internal parts are stainless steel. Seating surfaces are lapped at assembly to provide drop-tight sealing. The seals are made of high quality Nitrile based elastomers but alternate compounds are available upon special request.

Engineering Data

Valves are available to mate with standard NPTF pipe threads in port sizes from 1/2 inch NPTF to 3 inch NPTF. BSP pipe threads are also available for international exporting in port sizes from 1/2 inch BSP to 2 inch BSP inlet x 2 inch BSP outlet. The pressure rating is 4000 psi (275.8) bar at temperatures of 160F°(71°C) maximum.

How To Order

Select the valve for the appropriate size of the application from the chart.

For example: Order model number C194-4001 for a 1 inch valve.

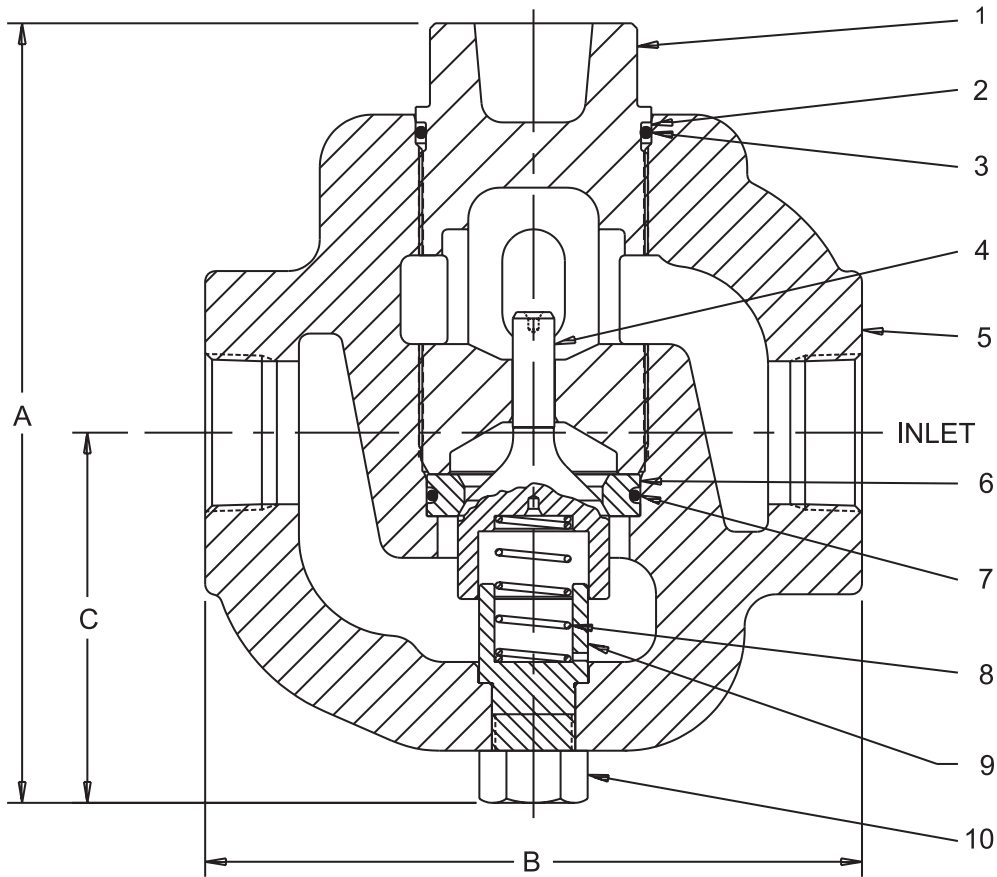
Spring Loaded Bronze Check Valve



The following data is provided as an aid in circuit design:

Size (NPTF)	Model Number	Cv*	Opening Pressure Minimum	
			psi	bar
1/2"	C194-2001	5.2	14	1.0
3/4"	C194-3001	6.9	14	1.0
1"	C194-4001	11.0	9	0.6
1-1/2"	C194-6001	23.2	9	0.6
2" X 2"	C194-7001	41.0	11	0.8
2" X 3"	C194-7002	41.0	14	0.8
3"	C194-9001	41.0	14	0.8

Note: * - Values are given at a maximum rating with the check fully open. In practice, Cv ratings will vary, due to the spring and the ability to maintain pressure under flow conditions.



Basic Dimensions

Model No.		C194-2001	C194-3001	C194-4001	C194-6001	C194-7001	C194-7002	C194-9001
A	inch	5.00	6.38	6.62	9.38	11.56	11.56	11.56
	mm	127	162	168	238	294	294	294
B	inch	3.38	4.75	5.50	7.88	9.75	9.75	9.75
	mm	86	121	140	200	248	248	248
C	inch	2.44	3.00	3.38	4.50	5.62	5.62	5.62
	mm	62	76	86	114	143	143	143
Minimum Flow Area	inch ²	0.249	0.463	0.796	1.766	2.989	2.989	2.989
	mm ²	161	299	514	1139	1928	1928	1928

Size (NPTF)	1/2"	3/4"	1"	1-1/2"	2" In X 2" Out	2" In X 3" Out	3"	Description
Model No.	C194-2001	C194-3001	C194-4001	C194-6001	C194-7001	C194-7002	C194-9001	
Item No.	Part Number							
1	C863-002	C863-007	C863-013	C873-011	C863-022	C863-022	C863-022	Seat Retainer
2	H143-17	H143-25	H143-29	H143-38	H143-42	H143-42	H143-42	Back-Up Ring
3	H136-02	H136-51	H137-14	H137-51	H138-03	H138-03	H138-03	Retainer O-Ring
4	C833-006	C833-009	C833-013	C833-015	C833-020	C833-020	C833-020	Check
5	C093-184	C093-041	C093-059	C093-093	C093-113	C093-112	C093-133	Body
6	C923-017	C963-040	C963-130	C963-098	C963-142	C963-142	C963-142	Seat Ring
7	-	H136-87	H136-51	H137-44	H137-64	H137-64	H137-64	O-Ring
8	D293-066	D293-007	D293-011	D293-023	D293-019	D293-019	D293-019	Spring
9	D153-023	D203-001	D203-002	D203-005	D203-007	D203-007	D203-007	Guide Stud
10	H060-23	C573-021	C573-025	C573-029	C583-025	C583-025	C583-025	Guide Nut

4000 psi (275.8 bar) 3-Way Two Pressure Hydraulic Diaphragm Operated Control Valves Tapped 3/4", 1", 1-1/2" & 2"

Media: Raw Water, Oil, Water and Soluble Oil

Low Pressure: 75 - 1000 psi (5.2 to 69.0 bar)

Maximum High Pressure: 4000 psi (275.8 bar)

Seat-Sleeve Type Max. Temp.: 160°F (71°C)



Sinclair Collins® Two-Pressure Hydraulic Control Valves are widely used in press operations or in other similar applications where low and high operating pressure are employed. Diaphragm-operated, they may be actuated by manually, electrically or mechanically operated air valves, or by time controllers. They are designed to control two pressure systems - low pressure ranging from 75 to 1000 psi and high pressures up to 4000 psi.

The "low pressure" range of a Two-Pressure Valve depends upon the **High Pressure Inlet Valve** ordered for the assembly. High Pressure Inlet Valves are available for "lower pressure" ranges of 75 to 150, 125 to 350, and 500 to 1000 psi. An adjustment screw on the High Pressure Inlet Valve permits accurate regulation of the low pressure point (within the operating range) at which the high pressure "kicks in".

In most press operations, low-pressure is used to close the ram. As the ram closes and resistance increases in the system, the resulting low-pressure build-up moves the plunger of the High Pressure Inlet Valve and High-Pressure "kick-in" can also be controlled for

"on" or "off" operation by substituting a standard 2-way normally closed valve in place of the automatic High Pressure Inlet Valve. Our model C204-2001, a 1/2" 4000 psi normally closed valve, is recommended. This type of installation might be used where the first phase of a cure is run under low-pressure and the cure completed under high pressure.

By the addition of a reverse-acting valve in the low pressure inlet line, the press ram can be held in any position desired; or the ram can be allowed to close the mold to the point where the ram pressure will increase a few pounds. This slight back pressure is used to close an inlet valve which bypasses the inlet pressure through a smaller orifice so the ram will close slowly before the high pressure automatically "kicks in".

Pull-backs can be supplied through a 3-way valve and the pressure automatically removed from pull-back cylinders while the ram is descending and also for curing time; at end of cure, the pressure can be restored to pull-back.

If you require assistance or product recommendations for any application, do not hesitate to call our sales representative.

Main Valve Body with Integrally Cast Check Valve Housing

Sinclair Collins® Two-Pressure Valves combine simplicity of construction ruggedness and quality materials throughout to assure long trouble-free service.

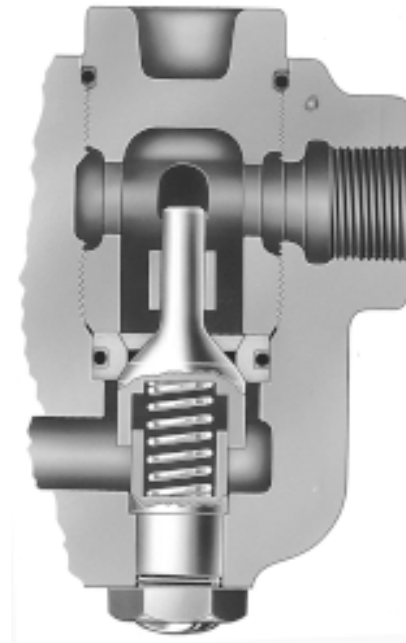
The body of the main valve and that of the low-pressure inlet check valve are cast as a solid unit. This eliminates both the possibility of joints becoming loose and units being improperly assembled during maintenance. The body material is high quality ASTM-B61 bronze for valve sizes 3/4" thru 2".



Check Valve

The integral check valve on Sinclair Collins® Two-Pressure valves is designed to eliminate failure due to particles of scale or dirt lodging on the seat and permitting high-pressure to leak back into low-pressure lines. By inverting the seating arrangement, hydraulic fluid flows down across the seat and into the main valve. Dirt cannot easily collect on the seat as can be the case where the seat is in the bottom of the chamber. The check is seated by a spring which is completely caged and cannot become loose and lodge itself in the main valve where it might cause damage to the valve seats. The seat retainer serves as guide and check seat ring retainer. Sufficient threads have been used to insure that maximum pressures can be used.

Valve fastenings are all standard so that no special tools are required for servicing valves.



Two Pressure Hydraulic Control Valve Technical Data

Note:

Specify model number of main valve. This number does not include the High-Pressure Inlet Valve. If a High-Pressure Inlet Valve is needed, order it, too, by model number, selecting the model providing the low-pressure range required by the application. (See table at bottom of page.)

Size (NPTF)	Model Number	Cv		
		Inlet To Ram	Ram To Drain	Low Pressure Inlet To Ram
3/4"	C014-3002	10.2	7.8	6.9
1"	C014-4002	22.0	14.0	11.0
1-1/2"	C014-6002	24.5	29.5	23.2
2"	C014-7001	26.0	52.0	41.0

Size (NPTF)	Model Number	Port Size (NPTF)			
		High-Pressure Inlet	Low-Pressure Inlet	Cylinder Port	Drain Port
3/4"	C014-3002	1/2"	3/4"	1-1/4"	1-1/4"
1"	C014-4002	1/2"	1"	1-1/2"	1-1/2"
1-1/2"	C014-6002	1/2"	1-1/2"	2"	2"
2"	C014-7001	1/2"	2"	3"	3"

Choice of High-Pressure Inlet Valves

The choice of High-Pressure Inlet Valves is shown in the table below. These valves should be selected on the basis of the low-pressure operating range required for each application.

Automatic High-Pressure Inlet Valves	
Model No.	Low-Pressure Range*
C344-2001	75 to 150 psi (5.2 to 10.3 bar)
C344-2003	125 to 350 psi (8.6 to 24.1 bar)
C344-2008	500 to 1000 psi (34.5 to 69.0 bar)

Automatic High-Pressure Inlet Valves W/Diaphragm Top	
Model Number	Low-Pressure Range
C344-2002	75 to 150 psi (5.2 to 10.3 bar)
C344-2004	125 to 350 psi (8.6 to 24.1 bar)
C344-2009	500 to 1000 psi (34.5 to 69.0 bar)

* An adjustment screw on the valve permits the high-pressure "kick-in" to be set at any pressure within this range

* An adjustment screw on the valve permits the high-pressure "kick-in" to be set at any pressure within this range. It is very important that the valves be adjusted to open after the low-pressure has raised the ram and is near its ultimate pressure in the ram. **Under no circumstances should the automatic high-pressure valve be opened during the full-stroke of the ram. These valves are designed only to finish the closing of the ram and should not be used for long sustained flows.**

GPM Flow for Two-Pressure Valves

PSI	Approximate Velocity (ft./sec.)	C014-3002	C014-4002	C014-6002	C014-7001
		3/4" NPTF	1" NPTF	1-1/2" NPTF	2" NPTF
GPM Flow					
100	17.0	25.4	41.4	94.0	167.0
200	24.6	36.9	59.8	136.0	242.0
300	30.5	45.5	74.2	169.0	300.0
400	34.8	52.0	84.5	193.0	343.0
500	38.8	58.0	94.2	215.0	382.0
600	42.5	63.6	103.2	236.0	419.0
700	46.3	69.4	112.5	256.0	456.0
800	49.2	73.7	119.7	272.0	485.0
900	51.3	76.8	124.5	284.0	505.0
1000	53.2	79.7	129.2	295.0	524.0
Area Thru Seat - Sq. In.		0.481	0.785	1.795	3.150

Note: Flow rates listed above are obtained from actual installations. Pipe must be free from any restrictions. By dividing the GPM flow listed by the "gallon per inch" values shown below for any ram diameter, the ram speed in inches per minute can be determined. In case more flow is desired, a two-way valve piped parallel will provide additional flow.

RAM Diameter - Gallons per Inch

Ram Dia. inch	Gal./inch	Ram Dia. inch	Gal./inch	Ram Dia. inch	Gal./inch	Ram Dia. inch	Gal./inch	Ram Dia. inch	Gal./inch	Ram Dia. inch	Gal./inch	Ram Dia. inch	Gal./inch	Ram Dia. inch	Gal./inch	Ram Dia. inch	Gal./inch
1"	.003	4"	.054	7"	.167	10"	.340	16"	.870	22"	1.65	28"	2.67	34"	3.94	40"	5.44
1-1/2"	.008	4-1/2"	.069	7-1/2"	.191	11"	.411	17"	.983	23"	1.80	29"	2.86	35"	4.17	41"	5.72
2"	.014	5"	.085	8"	.218	12"	.490	18"	1.10	24"	1.96	30"	3.06	36"	4.41	42"	6.00
2-1/2"	.023	5-1/2"	.103	8-1/2"	.246	13"	.575	19"	1.23	25"	2.13	31"	3.27	37"	4.65	43"	6.29
3"	.031	6"	.122	9"	.275	14"	.666	20"	1.36	26"	2.30	32"	3.48	38"	4.91	44"	6.58
3-1/2"	.042	6-1/2"	.144	9-1/2"	.307	15"	.765	21"	1.50	27"	2.48	33"	3.70	39"	5.17	45"	6.89

Piping Information

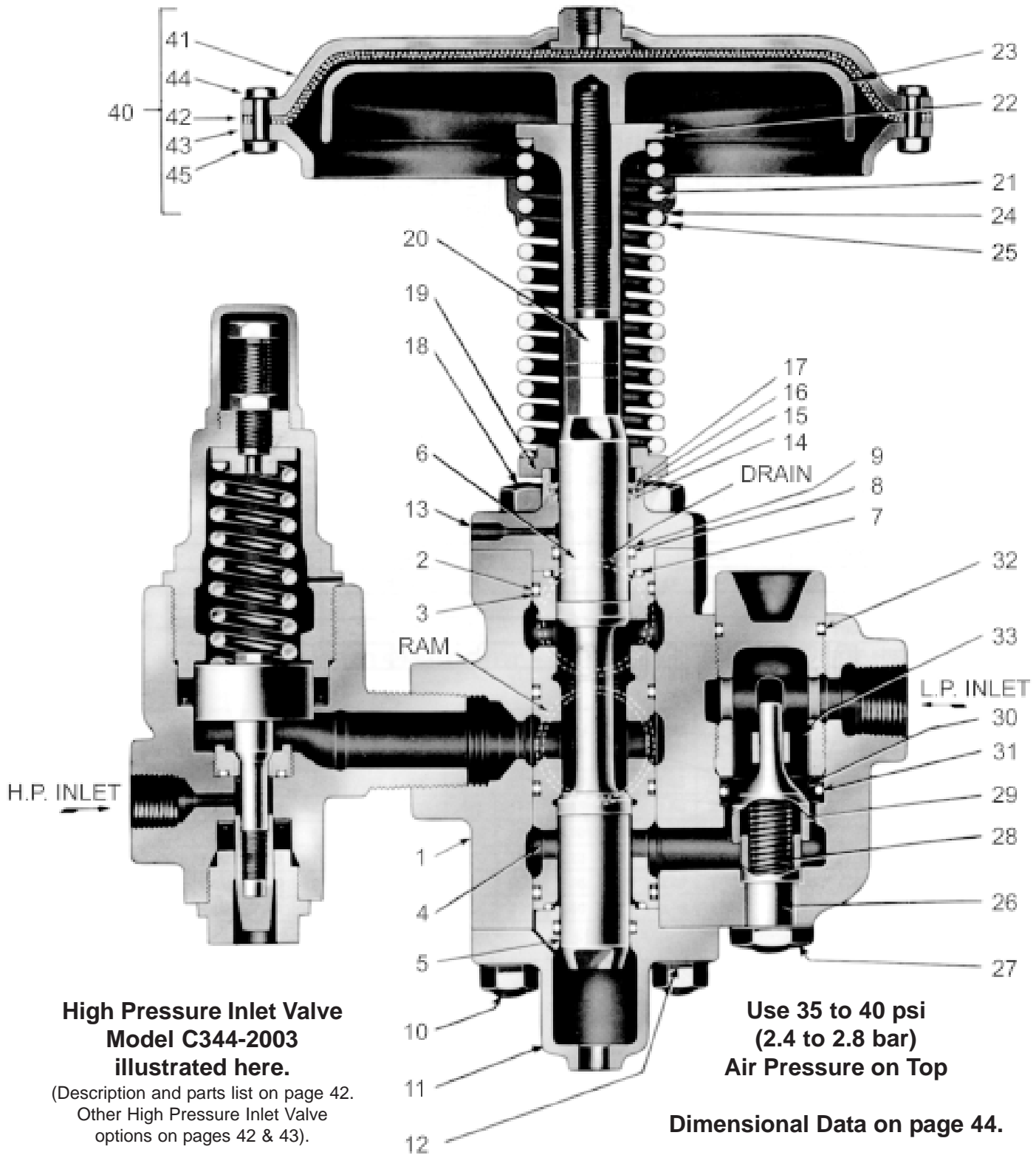
Area through valves in all directions is equal to or greater than the area through Low-Pressure Inlet pipes of Schedule 80 pipe.

Pipe to rams must be of double extra strength type and therefore larger in size to provide flow area equal to the area through the Low-Pressure Inlet pipe or the valve itself. Pipe sizes to the ram must be those specified below, for which the valve is tapped, or the ram speed will be drastically reduced.

Valve Model Number	Valve Size L.P. Inlet Schedule 80 Pipe Size	Ram Piping Double Extra Strength Pipe Size	Area Thru L.P. Inlet Schedule 80 Pipe Size (sq. inches)	Area Thru Ram Piping Double Extra Strength Pipe Size (sq. inches)
C014-3002	3/4"	1-1/4"	.432	0.63
C014-4002	1"	1-1/2"	.719	0.95
C014-6002	1-1/2"	2"	1.767	1.774
C014-7001	2"	3"	2.953	4.155

Low-Pressure: (Depending upon High-Pressure Inlet Valve selected) 75 to 1000 psi (5.2 to 69.0 bar)

Maximum High-Pressure: 4000 psi (275.8 bar)



Size (NPTF)	3/4"	1"	1-1/2"	2"	Description
Model No.	C014-3002	C014-4002	C014-6002	C014-7001	
Item No.	Part Number				
1	C093-037	C093-060	C093-084	C093-100	Body
• 2	H137-07	H137-24	H137-55	H138-06	O-Ring (4)
• 3	H143-26	H143-30	H143-39	H143-43	Back-Up Wahser (8)
4	D013-006	D013-008	D013-009	D013-011	Seat Sleeve
5	D113-013	D113-020	D113-031	D113-036	Lower Stem
6	D143-021	D143-035	D143-047	D143-057	Upper Stem
• 7	H136-17	H136-43	H137-36	H137-55	O-Ring (2)
• 8	H135-41	H136-17	H239-22	H137-46	O-Ring (2)
• 9	H143-11	H143-19	H143-31	H143-36	Back-Up Wahser (4)
10	D153-061	D153-061	D153-061	D153-094	Stud-Yoke & Bottom Cap
11	C213-066	C213-071	C213-087	C213-099	Bottom Cap
12	C573-016	C573-016	C573-016	H060-34	Hex Nut
13	D283-080	D283-082	D283-103	D283-123	Yoke
• 14	H092-10	-	H092-22	-	Wiper Ring (1)
• 15	D043-082	-	D043-098	-	Spacer (1)
• 16	H092-09	H092-14	H092-23	-	Scraper Ring (1)
• 17	H090-47	H090-49	H090-52	-	Retainer Ring (1)
18	-	-	D153-076	D153-086	Yoke Stud (Not Shown)
19	D083-022	D083-027	-	-	Spring Washer
20	D133-010	D133-016	D133-020	D133-053	Stem Extension Screw
21	D293-043	C293-048	C293-057	D293-059	Spring
22	C633-24	C633-026	C633-030	C633-034	Spring Ret. Nut
23	C783-086	C783-104	C783-113	C783-128	Piston
24	H175-21	H175-21	H175-21	H175-27	Lock Washer
25	H096-48	H096-49	H096-49	H097-08	Cap Screw
26	D203-001	D203-002	D203-005	D203-007	Check Guide Stud
27	C573-021	C573-025	C573-029	C583-025	Check Guide Stud Nut
28	D293-007	D293-011	D293-023	D293-019	Check Spring
29	C833-009	C833-013	C833-015	C833-020	Check Seat
30	C963-040	C963-130	C963-098	C963-142	Check Seat Ring
• 31	H136-87	H136-51	H137-44	H137-64	O-Ring (1)
• 32	H136-51	H137-14	H137-51	H138-03	O-Ring (1)
33	C863-007	C893-013	C873-011	C893-022	Seat Retainer
40	C392-008	C392-009	C392-010	C392-011	Top Assembly
41	C293-032	C293-036	C293-042	C293-047	Cover
42	C333-030	C333-031	C333-037	C333-043	Diaphragm
43	C893-027	C893-031	C893-037	C893-045	Ring
44	H096-10	H096-10	H096-12	H096-12	Cap Screw
45	H060-03	H060-03	H060-03	H060-03	Hex. Nut
	C182-045	C182-046	C182-047	C182-013	Repair Kit

• Included in Seal Kit

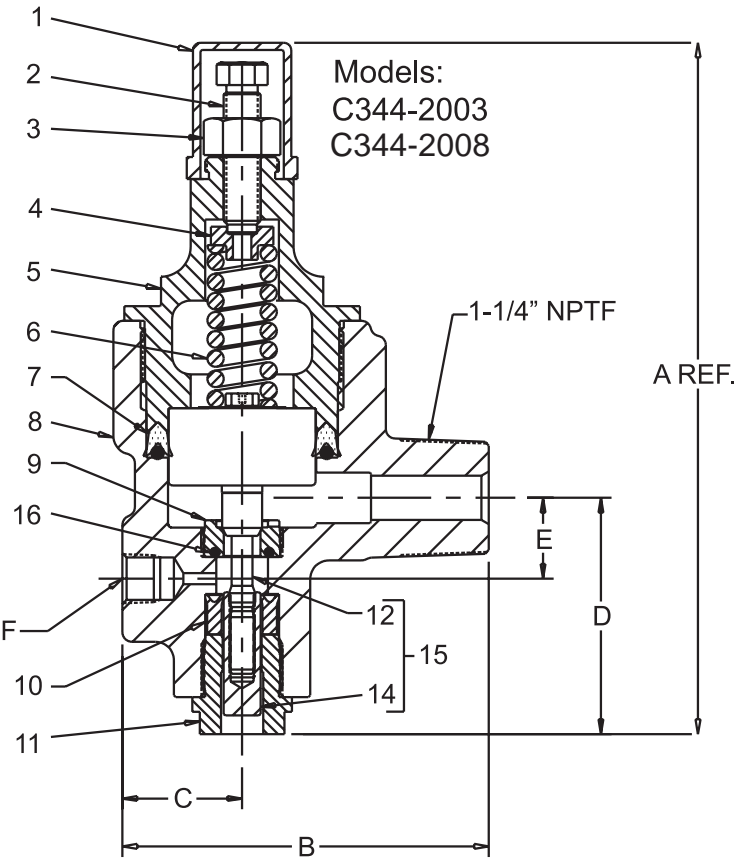
When Ordering parts: In addition to the part number, specify valve size (L.P. Inlet Pipe Size) and the model number shown on the nameplate.

For part numbers of HIGH PRESSURE INLET VALVES see parts drawings on pages 42 & 43.

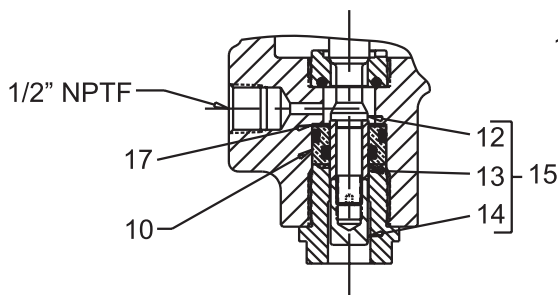
High Pressure Automatic Inlet

Basic Dimensions

Model #		C344-2001	C344-2003	C344-2008
A	inch	11.84	11.50	14.09
	mm	301	292	376
B	inch	6.22	5.56	5.56
	mm	158	141	141
C	inch	2.03	2.00	2.00
	mm	52	51	51
D	inch	4.00	3.62	3.62
	mm	102	92	92
E	inch	1.38	1.06	1.06
	mm	35	27	27



Model: C344-2001

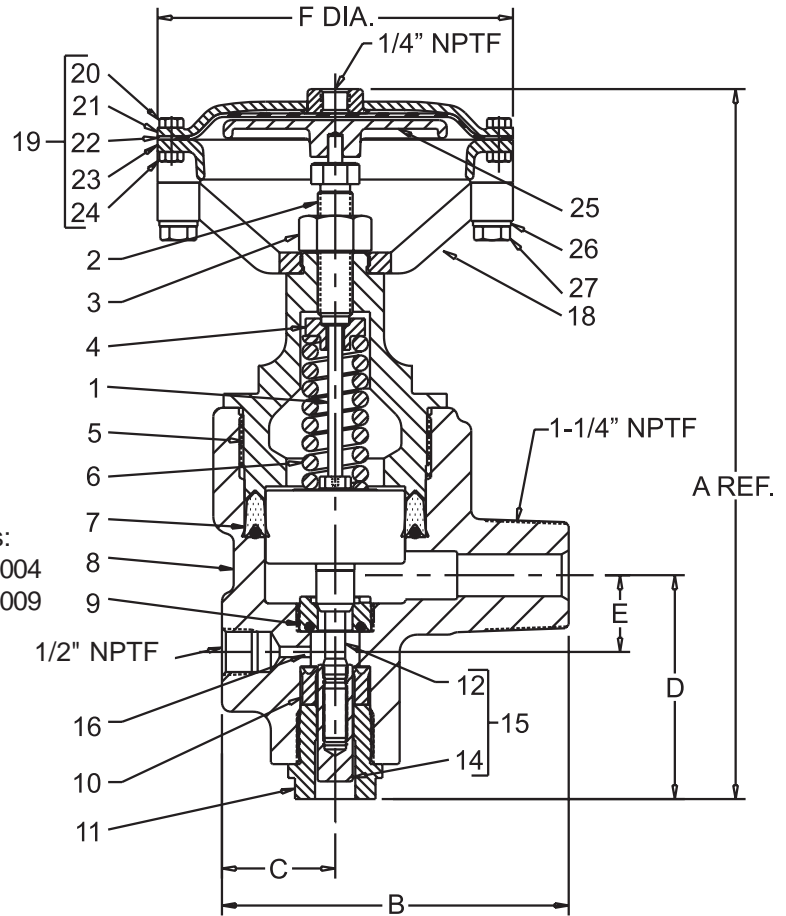


Range	75 to 150 psi (5.2 to 10.3 bar)	125 to 350 psi (8.6 to 24.1 bar)	500 to 1000 psi (34.5 to 69.0 bar)	Description
Model No.	C344-2001	C344-2003	C344-2008	
Item No.	Part Numbers			
1	C213-167	C213-167	C213-167	Cap
2	C913-016	C913-016	C913-016	Adjusting Screw
3	H062-23	H062-23	H062-23	Adjusting Screw Nut
4	C883-001	C883-004	C883-002	Spring Cup
5	C113-026	C113-019	C113-054	Bonnet
6	D293-065	D293-020	D293-044	Spring
7	C683-044	C683-034	C683-034	Packer, Large End
8	C093-009	C093-008	C093-008	Body
9	C983-006	C983-036	C983-036	Seat Ring
10	C189-20020	C683-008	C683-008	Packer, Small End
11	C213-125	C213-065	C213-065	Retainer, Small End Packer
12	C332-061	C332-072	C332-072	Stem Assembly
13	C813-012	-	-	Sleeve
14	C573-008	D033-017	D033-017	Nut
15	C332-062	C332-018	C332-018	Stem and Plunger Assembly
16	-	H135-25	H135-25	O-Ring
17	D223-043	-	-	Packer Ring

High Pressure Automatic Inlet Diaphragm Top

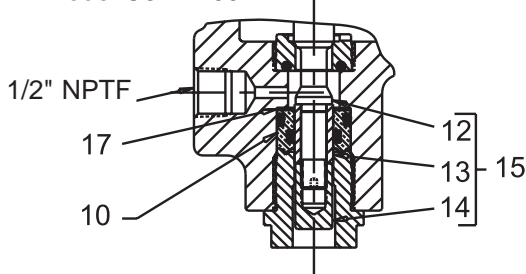
Basic Dimensions

Model #		C344-2002	C344-2004	C344-2009
A	in.	12.66	12.62	16.25
	mm	322	320	413
B	in.	6.22	5.62	5.62
	mm	158	143	143
C	in.	2.03	2.00	2.00
	mm	52	51	51
D	in.	4.00	3.62	3.62
	mm	102	92	92
E	in.	1.38	1.06	1.06
	mm	35	27	27
F	in.	6.50	6.50	8.25
	mm	165	165	210



Models:
C344-2004
C344-2009

Model C344-2002

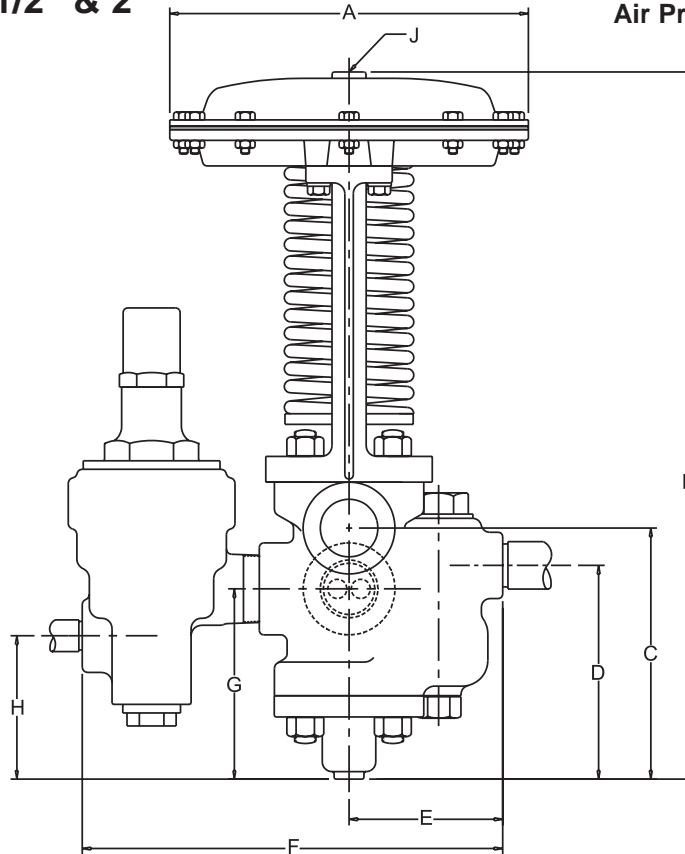


Range	75 to 150 psi (5.2 to 10.3 bar)	125 to 350 psi (8.6 to 24.1 bar)	500 to 1000 psi (34.5 to 69.0 bar)	Description
Model No.	C344-2002	C344-2004	C344-2009	
Item No.	Part Numbers			
1	D093-015	D093-010	D093-013	Stem
2	C913-016	C913-016	C913-016	Adjusting Screw
3	H062-23	H062-23	H062-23	Adjusting Screw Nut
4	C883-001	C883-004	C883-002	Spring Cup
5	C113-026	C113-019	C113-054	Bonnet
6	D293-065	D293-020	D293-044	Spring
7	C683-044	C683-034	C683-034	Packer, Large End (1)
8	C093-009	C093-008	C093-008	Body
9	C983-006	C983-036	C983-036	Seat Ring
10	C180-20020	C683-008	C683-008	Packer, Small End (1)
11	C213-125	C213-065	C213-065	Retainer, Small End Packer
12	C332-061	C332-072	C332-072	Stem Assembly
13	C813-012	-	-	Sleeve
14	C573-008	D033-017	D033-017	Nut
15	C332-062	C332-018	C332-018	Stem and Plunger Assembly
16	-	H135-25	H135-25	O-Ring (1)
17	D223-043	-	-	Packer Ring
18	D283-018	D283-018	D283-034	Yoke
19	C392-001	C392-001	C392-007	Diaphragm Top Assembly
20	H096-10	H096-10	H096-10	Cap Screw
21	C293-018	C293-018	C293-091	Cover
22	C333-010	C333-010	C333-022	Diaphragm (1)
23	C893-050	C893-050	C893-048	Ring
24	H060-03	H060-03	H060-03	Hex. Nut
25	C783-033	C783-033	C783-064	Piston
26	H175-16	H175-16	H175-21	Lock Washer
27	H096-32	H096-32	H096-52	Cap Screw

**4000 psi (275.8 bar),
 3-Way Two Pressure Hydraulic Valves
 Tapped 3/4", 1", 1-1/2" & 2"**

Media: Raw Water, Oil,
 Water and Soluble Oil

Use 35 to 40 psi
 (2.4 to 2.8 bar)
 Air Pressure on Top



Basic Dimensions

Size (NPTF)		3/4"	1"	1-1/2"	2"
Model No.		C014-3002	C014-4002	C014-6002	C014-7001
A	inch	10.50	11.75	13.12	16.25
	mm	267	298	333	413
B	inch	17.47	18.75	25.09	29.94
	mm	444	476	637	760
C	inch	7.31	7.88	10.19	12.70
	mm	186	200	259	323
D	inch	6.25	6.50	8.94	11.52
	mm	159	165	227	273
E	inch	4.50	5.31	7.06	8.38
	mm	114	135	179	213
F	inch	12.00	13.25	15.31	17.06
	mm	305	337	389	433
G	inch	5.56	5.88	8.00	9.08
	mm	141	149	203	231
H	inch	4.50	4.81	6.94	8.02
	mm	114	122	176	204
J	inch	1/4 NPTF	1/4 NPTF	1/4 NPTF	3/8 NPTF
Center Line of Valve to Face of Ram Connection	inch	2.62	3.25	3.75	4.62
	mm	67	83	95	117
Center Line of Valve to Face of Drain Connection	inch	2.62	3.25	4.44	4.62
	mm	67	83	113	117

4000 psi (275.8 bar) 2-, 3- & 4-Way Valves
Tapped 1/2", 3/4", 1", 1-1/2", 2" & 3"

Media: Raw Water, Oil, Water and Soluble Oil

Description

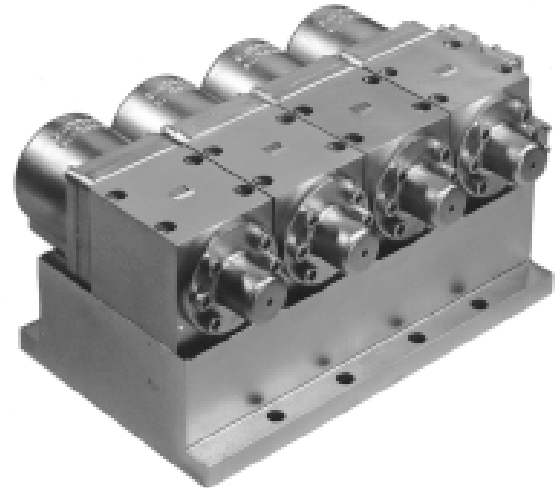
These pneumatically piloted, spring return, cylinder actuated valves are designed for the severe conditions associated with the primary metals industries and similar applications. Conservatively rated at 4000 psi (275.8 bar), raw water, oil or water and soluble oil are easily handled by the stainless steel, bronze, and other material used in their construction.

Features

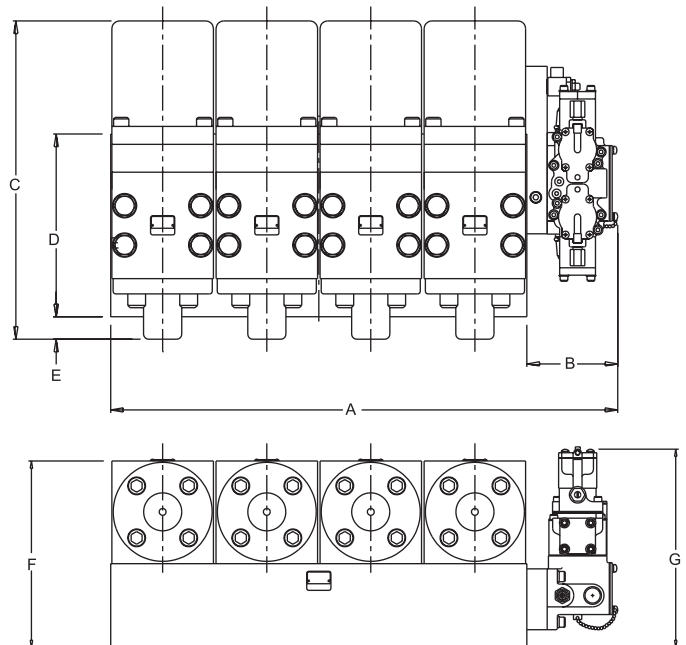
The main valve incorporates the same seat-sleeve principle, quality materials and expert fabrication typical of Sinclair Collins® high pressure hydraulic valves. Cylinder actuators use floating pistons. For 4-way valve functions, there are four 2-way, normally closed valving modules used to control the flow of fluids. The modules are, in turn, controlled by an air pilot valve, known for its long term performance, to produce the required function. Pilot valve exhaust ports are provided with adjustable speed control mufflers to aid in tuning valve shift to system requirements. 3-way valving functions require two 2-way modules and 2-way valving functions require only one module.

Engineering Data

Valve stems are stainless steel. Module bodies and manifold blocks are carbon steel for oil or water with soluble oil services. Module bodies for raw water services should be specified as bronze. The manifold blocks are available with appropriate size of port tapping from 1/2" through 1-1/2" as well as a variety of alternate styles of connection such as direct socket weld and SAE 4-bolt flanges. The 2-way, normally closed modules contain single-acting cylinders. They are pneumatically actuated by a 3/8" Air Pilot valve. Floating pistons reduce sideloading and wear; indicator pins on the end cap ends indicate stem position. Pneumatic circuitry is set up by a combination of the appropriate valve and selected piping of the manifold blocks to provide the desired valve function as specified by the last two digits of the model number.



Pictured is a 4-way valve



Basic Dimensions

Basic Size		A	B	C	D	E	F	G
1/2"	inch	19.90	3.40	12.67	5.75	2.78	8.38	9.79
	mm	506	86	322	146	71	213	249
1"	inch	23.90	3.40	15.71	8.25	2.56	9.37	10.79
	mm	607	86	399	210	65	238	274
1-1/2"	inch	27.90	3.40	16.48	11.50	1.70	11.88	11.28
	mm	209	86	419	292	43	302	287

Note: Subbase dimensions may vary depending on desired port locations and connections.

		C6	Port Location 1	Port Option 4	Basic & Port Size 22	Pipe Style 1	Function 01
Port Location							
1 - Bottom Port Subbase; Steel Body Modules							
2 - Bottom Port Subbase; Bronze Body Modules							
3 - Side Port Subbase; Steel body Modules							
4 - Side Port Subbase; Bronze Body Modules							
Port Option							
4 - Remote Pilot							
5 - Integral Elect. Pilot							
Basic & Port Size							
	Basic Module	Port Connections		Basic Module	Port Connections		
22 -	1/2"	1/2"	46 -	1"	1-1/2"		
23 -	1/2"	3/4"	65 -	1-1/2"	1-1/4"		
24 -	1/2"	1"	66 -	1-1/2"	1-1/2"		
43 -	1"	3/4"	67 -	1-1/2"	2"		
44 -	1"	1"	77 -	2"	2"		
45 -	1"	1-1/4"	79 -	2"	3"		
Pipe Style							
1 - Direct Pipe Thread							
2 - Direct Socket Weld							
3 - 3000 psi SAE 4-Bolt Pipe Thread							
4 - 3000 psi SAE 4-Bolt Socket Weld							
5 - MSA Manifold							
Function				Function			
01 - 2-Way, Normally Open				13 - 4-Way, 3 Position, Center — P to T Through A, B Blocked			
02 - 2-Way, Normally Closed				14 - 4-Way, 3-Position, Center — P to T Through B, A Blocked			
03 - 3-Way, 2 Position, P to A, T Blocked				15 - 4-Way, 3-Position, Center — P to A and B, T Blocked			
04 - 3-Way, 2-Position, P Blocked, A to T				16 - 4-Way, 3-Position, Center — P Blocked, A and B to T			
05 - 3-Way, 3-Position, Center — All Ports Blocked				17 - 4-Way, 3-Position, Center — P and A Blocked, B to T			
06 - 3-Way, 3 Position, Center — P to T Through A				18 - 4-Way, 3-Position, Center — P and B Blocked, A to T			
07 - 3-Way, 3 Position, Center — P to A, T Blocked				19 - 2-Way Double Solenoid (Momentary Contact)			
08 - 3-Way, 3 Position, Center — P Blocked, A to T				20 - 3-Way, 2-Position, Double Solenoid (Momentary Contact)			
09 - 4-Way, 2-Position, — P to A, B to T				21 - 4-Way, 2-Position, Double Solenoid (Momentary Contact)			
10 - 4-Way, 2-Position, P to B, A to T							
11 - 4-Way, 3-Position, Center — All Ports Blocked							
12 - 4-Way, 3 Position, Center — All Ports Opened							

4000 psi (275.8 bar) 2-Way, PMI Modules

Basic Sizes: 1/2", 1", 1-1/2" & 2"

Media: Raw Water, Oil, Water and Soluble Oil

Features of the PMI Valves

These valves are uniquely designed for application in the primary metals industries, petroleum and similar industries where service conditions are severe and downtime is critical. The established Sinclair Collins® seat-sleeve valving principle is utilized to reduce the number of dynamic seals and provide the rugged construction needed. Long-term, trouble-free performance is ensured and backed by 50 years of experience with similar valves operating up to 6000 psi (414 bar).

We have incorporated our hardened, stainless steel seat sleeves into convenient, pneumatically actuated, 2-way modules that can be combined on bases and programmed to provide any of the output functions in common usage. The module approach eliminates the need for the in-the-line repair or removal of the complete valve. Should a problem develop, only the suspected module need be replaced. All electrical, signal and service ports are manifolded, so a change is accomplished by removal of no more than four (4) cap screws. Module weights are such that the need for cranes or temporarily rigged chain hoists in tight quarters is eliminated. Downtime is minimized.

Basic valves are rated for continuous service up to 4000 psi (275.8 bar) handling oil and soluble oil. Substituting centrifugally cast, high density bronze bodies for the standard carbon steel bodies in the modules equips the valves for extended service on raw water applications. On request, the valves can be equipped to handle pressures up to 6000 psi (414 bar) with no change in overall sizes.

Assembled arrangements are provided to be piped into the systems as integral valves or to interface on subplates of the variety most commonly used.

Description of the Valve Modules

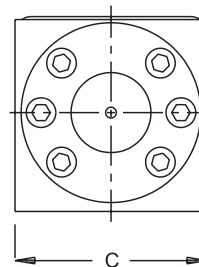
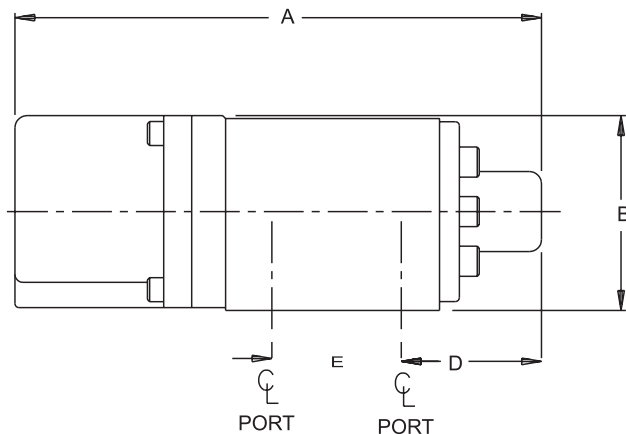
Sinclair Collins® high pressure valve modules employ a seat sleeve construction. The seat sleeve is made of hardened stainless steel for the extremely rugged service encountered in the Primary metals service. Its design successfully resists the cutting action of high velocity water. Both the inside and outside diameters are finished in the hardened state. Seats are lapped in place to assure drop tight seating. Each valve module must pass a drop tight test at rated pressure before being assembled into a final valve arrangement and shipment.

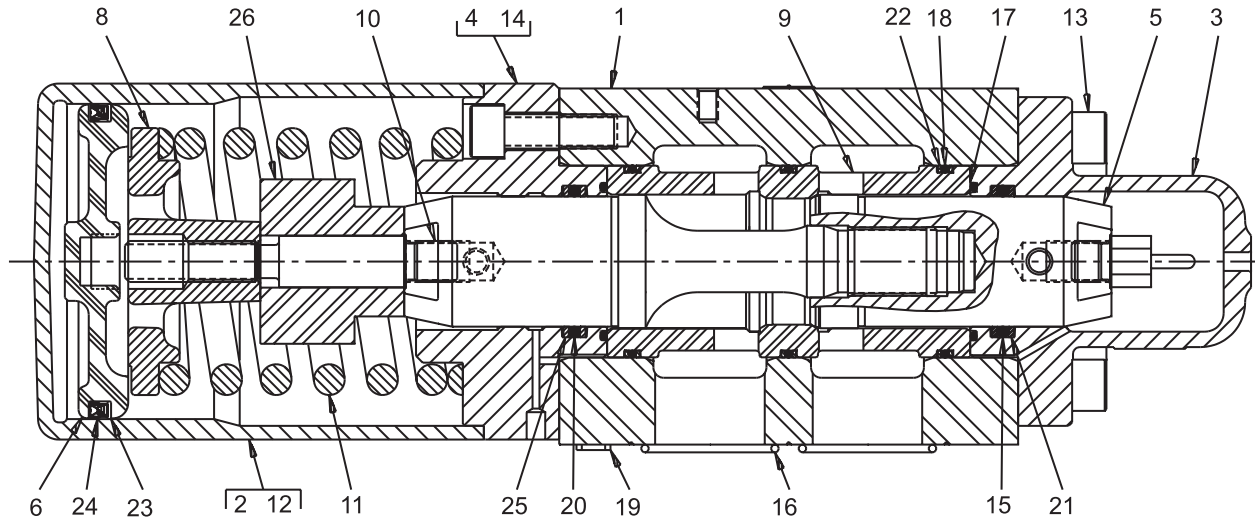


Basic Dimensions

Basic Size	Model Number		A	B	C	D	E
1/2"	C242-2001	inch	12.67	4.08	4.00	4.14	1.166
		mm	322	104	102	105	29.62
1"	C242-4001	inch	15.71	5.06	5.00	4.66	1.938
		mm	399	129	127	118	49.22
1-1/2"	C242-6001	inch	16.48	6.09	6.00	5.29	2.500
		mm	419	155	152	134	63.50
2"	C242-7001	inch	22.20	6.60	7.00	7.00	2.875
		mm	564	168	178	178	73.02

Note: Use 60 psi minimum in cylinder. Maximum temperature 160° F (71° C).





Size (NPTF)	1/2"	1"	1-1/2"	2"	Description
Model No.	C424-2001	C424-4001	C424-6001	C424-7001	
Item No.	Part Number				
1	C093-301	C093-302	C093-287	C093-303	Body
2	C112-006	C112-007	C112-008	C112-009	Cover Sub-Assembly
3	C213-048	C213-075	C213-082	C213-091	Bottom Cap
4	C213-208	C213-209	C213-210	C213-211	Spring Cap
5	C332-093	C332-094	C332-090	C332-095	Stem Sub-Assembly
	-	-	-	C813-058	Stem
6	C783-149	C783-150	C783-144	C783-151	Piston
8	C883-029	C883-030	C883-025	C883-031	Spring Retainer
9	D013-003	D013-007	D013-010	D013-012	Seat Sleeve
10	D133-069	D133-070	D133-064	D133-071	Stem Stud
11	D293-022	D293-144	D293-035	D293-053	Spring
12	H101-37	H102-05	H102-05	H102-31	Cap Screw
13	H102-01	H102-28	H102-28	H226-44	Cap Screw
•14	H134-27	H134-27	H134-27	H134-27	O-Ring
•15	H135-31	H136-24	H137-20	H137-46	O-Ring (1)
•16	H134-109	H136-29	H137-24	H137-44	O-Ring (2)
•17	H135-51	H136-43	H137-36	H137-55	O-Ring (2)
•18	H136-29	H137-24	H137-55	H138-06	O-Ring (3)
•19	H142-06	H142-06	H142-06	H142-06	Seal (2)
•20	H143-06	H143-19	H143-31	H143-37	Back-Up Washer (2)
•21	H143-09	H143-21	H143-33	H143-37	Back-Up Washer (2)
•22	H143-23	H143-30	H143-39	H143-43	Back-Up Washer (6)
•23	H143-106	H143-107	H143-105	H143-108	Back-Up Washer (1)
•24	H145-82	H145-77	H145-76	H145-78	Seal (1)
•25	H135-22	H136-17	H239-22	H137-46	O-Ring (1)
26	-	-	-	D123-018	Spring Stop
	C182-019	C182-020	C182-021	C182-022	Repair Kit

• Included In Seal Kit

When ordering parts: In addition to the part number, specify valve size and the model number shown on the nameplate.

4000 psi Diaphragm Operated Valves

Size (NPTF)	Valve Model No.	Area through Seat		Press. Drop		Approx. Velocity		Approx. Flow	
		Sq. in.	Sq. mm.	psi	bar	ft./sec.	m/sec.	GPM	litre/min.
1/2"	C204-2002*	.163	105.0	5	0.3	15	4.6	7.4	28
	C204-2001			10	0.7	20	6.1	10.4	39
	C204-2003			15	1.0	25	7.6	12.8	48
				20	1.4	29	8.8	14.8	56
3/4"	C204-3002	.163	105.0	5	0.3	16	4.9	8.0	30
	C204-3001			10	0.7	22	6.7	11.4	43
	C204-3003*			15	1.0	27	8.2	13.9	53
				20	1.4	32	9.8	16.1	61
1"	C204-4002	.296	191	5	0.3	18	5.5	16.5	62
	C204-4001*	.296	191	10	0.7	25	7.6	23.4	89
	C204-4003	.297	192	15	1.0	31	9.4	28.7	109
				20	1.4	36	11.0	33.1	125
1-1/4"	C204-5002	.499	322.0	5	0.3	17	5.2	26.4	100
	C204-5001*	.499	322.0	10	0.7	24	7.3	37.3	141
	C204-5003	.480	310.0	15	1.0	29	8.8	45.7	173
				20	1.4	34	10.4	52.8	200
1-1/2"	C204-6002*	.812	524.0	5	0.3	15	4.6	38.0	144
	C204-6001	.812	524.0	10	0.7	21	6.4	53.8	204
	C204-6003	.784	506.0	15	1.0	26	7.9	65.8	249
				20	1.4	30	9.1	76.0	288
2"	C204-7002	1.805	1165.0	5	0.3	11	3.4	64.8	245
	C204-7001			10	0.7	16	4.9	91.7	347
	C204-7003*			15	1.0	20	6.1	112.3	425
				20	1.4	23	7.0	129.7	491
3"	C204-9002	3.213	2073.0	5	0.3	12	3.7	120.7	457
	C204-9001*			10	0.7	17	5.2	170.8	646
				15	1.0	21	6.4	209.1	791
				20	1.4	24	7.3	241.5	914

Note: Flow rates listed above were derived by applying the formulas listed here in conjunction with seat areas and inlet to cylinder Cv values of valves marked by asterick (*). Specific gravity of media used was 1.0 (the specific gravity of water). If media with significantly different specific gravity is to be used velocity and flow rate figures should be divided by the square root of the specific gravity of media to be used.

The following formulas can be used for calculation of flow rate and velocity of a fluid:

Where

$$M = \frac{M \sqrt{M}}{\sqrt{M}}$$

GPM = Flow in gallons per minute
Cv = Flow coefficient of unit
G = Specific Gravity of Media
ΔP = Component pressure drop in PSI

Where

$$M = \frac{M}{A}$$

V = Velocity of media in feet per second
A = Area through valve seat in square inches
GPM = Flow in gallons per minute

6000 psi Diaphragm Operated Valves

Size (NPTF)	Valve Model No.	Area through Seat		Pressure Drop		Approx. Velocity		Approx. Flow	
		Sq. in.	Sq. mm.	psi	bar	ft./sec.	m/sec.	GPM	litre/min.
1/2"	C204-2005 C204-2004 C204-2006*	.163	105.0	5	0.3	12	3.7	6.3	24
				10	0.7	17	5.2	8.9	34
				15	1.0	21	6.4	10.8	41
				20	1.4	25	7.6	12.5	47
3/4"	C204-3005 C204-3004 C204-3006*	.163	105.0	5	0.3	12	3.7	6.3	24
				10	0.7	17	5.2	8.9	34
				15	1.0	21	6.4	10.8	41
				20	1.4	25	7.6	12.5	47
1"	C204-4005* C204-4004 C204-4006	.296	191	5	0.3	15	4.6	14.3	54
		.296	191	10	0.7	22	6.7	20.2	76
		.297	192	15	1.0	27	8.2	24.8	94
				20	1.4	31	9.4	28.6	108
1-1/4"	C204-5005* C204-5004 C204-5006	.499	322.0	5	0.3	16	4.9	24.6	93
		.499	322.0	10	0.7	22	6.7	34.8	132
		.480	310.0	15	1.0	27	8.2	42.6	161
				20	1.4	32	9.8	49.2	186
1-1/2"	C204-6005* C204-6004 C204-6006	.812	524.0	5	0.3	14	4.3	35.8	136
		.812	524.0	10	0.7	20	6.1	50.6	192
		.784	506.0	15	1.0	24	7.3	62	235
				20	1.4	28	8.5	71.6	271
2"	C204-7005 C204-7004 C204-7006*	1.805	1165.0	5	0.3	11	3.4	60.4	229
				10	0.7	15	4.6	85.4	323
				15	1.0	19	5.8	104.6	396
				20	1.4	21	6.4	120.7	457

Note: Flow rates listed above were derived by applying the formulas listed here in conjunction with seat areas and inlet to cylinder Cv values of valves marked by asterick (*). Specific gravity of media used was 1.0 (the specific gravity of water). If media with significantly different specific gravity is to be used velocity and flow rate figures should be divided by the square root of the specific gravity of media to be used.

The following formulas can be used for calculation of flow rate and velocity of a fluid:

$$M = \frac{M \sqrt{M}}{\sqrt{M}}$$

Where

GPM = Flow in gallons per minute

Cv = Flow coefficient of unit

G = Specific Gravity of Media

ΔP = Component pressure drop in PSI

$$M = \frac{M \quad M}{A}$$

Where

V = Velocity of media in feet per second

A = Area through valve seat in square inches

GPM = Flow in gallons per minute

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Parker Hannifin Corporation
Sinclair Collins Division
454 Morgan Avenue
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Phone: (330) 724-3535
Fax: (330) 724-3956
E-mail: Sinclair_Collins@parker.com
www.parker.com/sc

