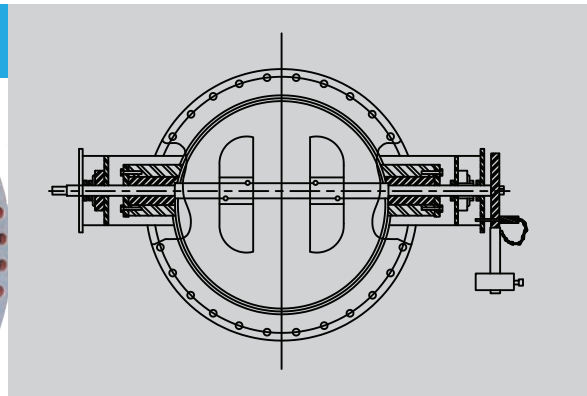
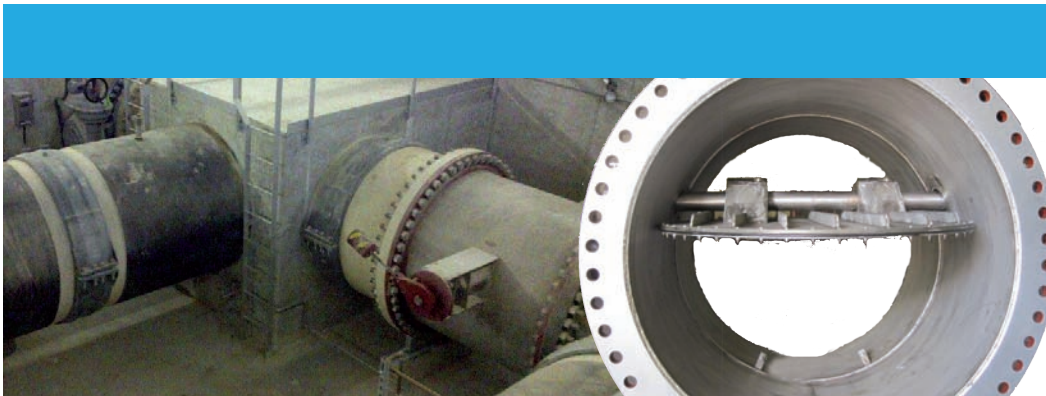


TTR Group Inc.

The Engineered Valve
& Speciality Products Company



TTR ECV Engineered Double Off Set Check Valve



**AWWA & Engineered Products
Project Management and Site Services**



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Valve & Application Solutions for the Municipal, Industrial, Mining and Power Industries



Standard Features and Benefits

1. Body is fabricated and the face to face can be designed to meet the face to face dimensions of the installation. The only restricting category is the face to face must accommodate the bearing and packing housing for the minimum face to face and cordal dimension.
2. Metal and Resilient Seated designs are available.
3. Larger shaft diameters.
4. Pre-loaded self-contained replaceable PolyPak seals NSF.
5. Back up field replaceable cartridge O-Ring Packing Seals - NSF.
6. Dual thrust, no load Dual External Roller Bearings that are field replaceable without depressurization.
7. Internal bearings and galvanic corrosion is eliminated.
8. Asymmetric design.
9. Modular design allows for twin adjustable counterweights and optional manual override.
10. Full range locking positions and lock out capability with mechanical position indicator.
11. Available in multiple end connection configurations.

Suggested Specifications

GENERAL: All valves shall incorporate locking pins for the open and closed position with intermediate locking positions for rate of flow control. Counter weight arms shall incorporate three keyways with adjustable arms for counterweights on both sides of the valve. All valves shall be manufactured in North America.

BODIES: All bodies shall be flanged manufactured of A-36 carbon steel to ANSI B16.1 class 125/150 and suitable for ANSI 150# flanges or AWWA class E flanges as required. All bodies shall incorporate flow arrows and traceability tags. All bodies shall be coated internally with NSF approved coatings unless manufactured of 316 stainless steel. All bodies shall incorporate lifting rings.

DISCS: All discs shall be A-36 carbon steel with double solid block hubs. Support ribs in line with the flow. Discs shall be NSF coated with minimum 8 mil thickness or approved coatings. All discs shall be tangentially pinned to the shaft bolted in place and field replaceable by means of taper pins.

SHAFTS: All shafts shall be one piece, 316 stainless steel, and supported by external replaceable roller bearings. Shafts shall be designed for near zero deflection at full delta-P and velocity at the point of inside diameter of the valve. Shafts shall incorporate one keyway in line with the disc and the body housing at both ends of the shaft.

Valve body shaft journals shall not guide or support the shaft more than 0.25" in the body and contain a Duralon material to prevent galvanic corrosion. Shaft ends shall accommodate limit switches for future field mount installation. Dual horizontal thrust bearings for shaft location shall be incorporated.

ENGINEERED PACKING & SEAL DESIGN: Twin self adjusting packing and O-Ring seal design eliminating the requirement for adjustment. This system is field replaceable without depressurizing the pipe. This unique cartridge system utilizes Parker PolyPak that is not dependent on live loading preventing high shaft seal torque. The back up static and dynamic O-ring cartridge is NSF certified and is field replaceable. Packing and seal adjustment is eliminated. Replacement provides consistent packing compression ensuring factory design settings.

BEARINGS: Permanently lubricated dual external roller bearings shall be incorporated and field replaceable without dewatering the system or removing the valve from service. External bearings shall be capable of twelve times the shear strength of the shaft. Internal bearings are not acceptable. All bearings shall be suitable for a corrosive environment.

SEATS: All valves shall incorporate seats made of the same material as the body and disc unless resilient seats are added as an option.

Shell Thickness Calculation

Shell thickness under internal pressure can be calculated using the following formulas from ASME boiler and pressure vessel code, Section 8, Division 1, UG-27.

For longitudinal stress:

$$t = \frac{PR}{2SE + 0.4P}$$

For circumferential stress:

$$t = \frac{PR}{SE + 0.4P}$$

t = minimum required shell thickness

P = internal design pressure

R = inside radius of the shell course under consideration

S = maximum allowable stress

E = joint efficiency

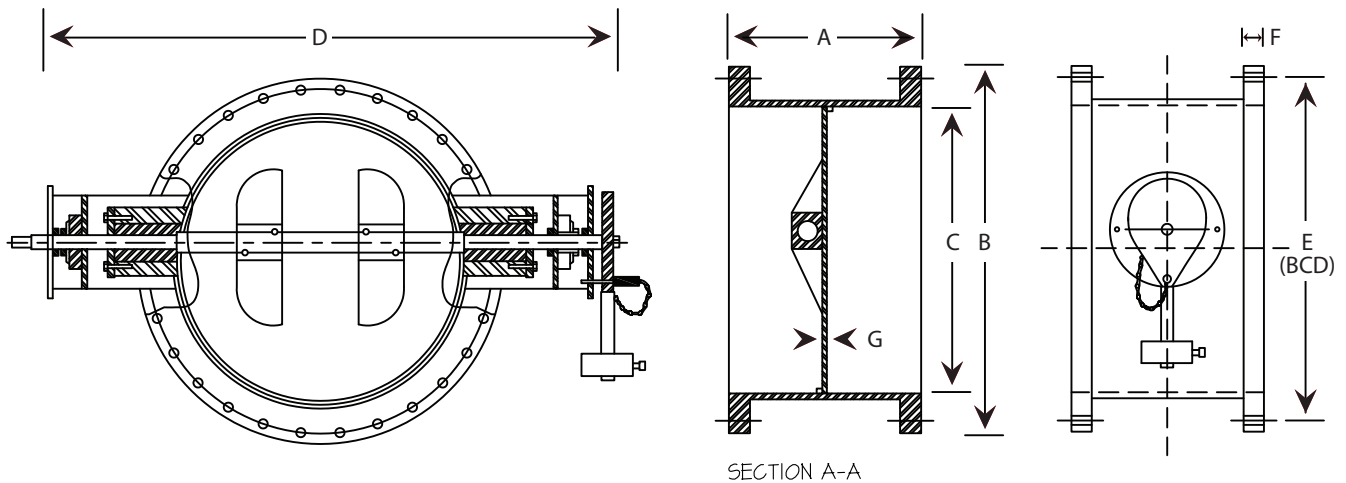
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Dimensions

Valve Size		A Face to Face	B	C	D	E (BCD)	F	G	Typical Shaft Dia.	Weight	
Inches	mm									Lbs	Kg
12	300	12.00	19.00	12.00	26.00	17.00	.812	0.50	1.50	120	55
14	350	12.00	21.00	14.00	30.00	18.75	.938	0.50	1.50	240	100
16	400	12.00	23.50	16.00	30.00	21.25	1.00	0.50	2.00	310	141
18	450	12.00	25.00	18.00	38.00	22.75	1.062	0.50	2.00	360	163
20	500	20.00	27.50	20.00	48.00	25.00	1.13	0.50	2.50	425	193
24	600	20.00	32.00	24.00	52.00	29.50	1.250	0.50	2.50	637	289
30	750	20.00	38.75	30.00	58.00	36.00	1.375	0.625	3.25	747	340
36	900	30.00	46.00	36.00	64.00	42.75	1.625	0.625	3.25	897	408
42	1050	42.00	53.00	42.00	79.00	49.50	1.750	0.625	3.25	1350	612
48	1200	42.00	59.50	48.00	88.00	56.00	1.875	0.625	3.50	1525	692
54	1350	42.00	66.25	54.00	98.00	62.75	2.125	0.750	4.00	1738	788
60	1500	60.00	73.00	60.00	114.00	69.25	2.250	0.750	4.00	1988	901



This is a special fabricated valve to suit a wide variety of applications.
Flange thickness may vary from AWWA C207 Class D to Class 125 LW ASTM A181.

Standard Bill of Materials

1	Body	A-36 Carbon Steel / Optional 316 Stainless Steel
2	Shaft	316 Stainless Steel
3	Disc	A-36 Carbon Steel / Optional 316 Stainless Steel
4	Bearings	External Permanently Lubricated Roller
5	Seat	Metal / Resilient Optional
6	Seals	Chevron - V Type Self Contained Live Loaded
7	Cover Arm	A-36 Carbon Steel
8	O-Rings	Viton NSF
9	Coating	NSF Approved 8 mil minimum

Valve I.D. to suit Pipe I.D.
Flange Drilling to ANSI B16.5 or customer requirements

Temperature Rating:
Maximum Temperature 250 F / 121 C

Pressure Rating:
Maximum Pressure: 150 PSIG (1034 kPa)
Test Pressure 225 PSIG (1551 kPa)
Valves are manufactured to maximum system or test pressure conditions

Options:

- Position Indicator
- Special Face to Face Dimension
- Resilient Seats: EPDM, Viton
- Automation
- Retransmission Modules
- Adjustable Travel Stops
- Manual Declutchable Override

End Connections:

- Flanged standard
- Plain End optional
- Flanged x VIC optional
- VIC x VIC optional

Engineered Submissions: All drawings will be issued in metric and imperial dimensions.

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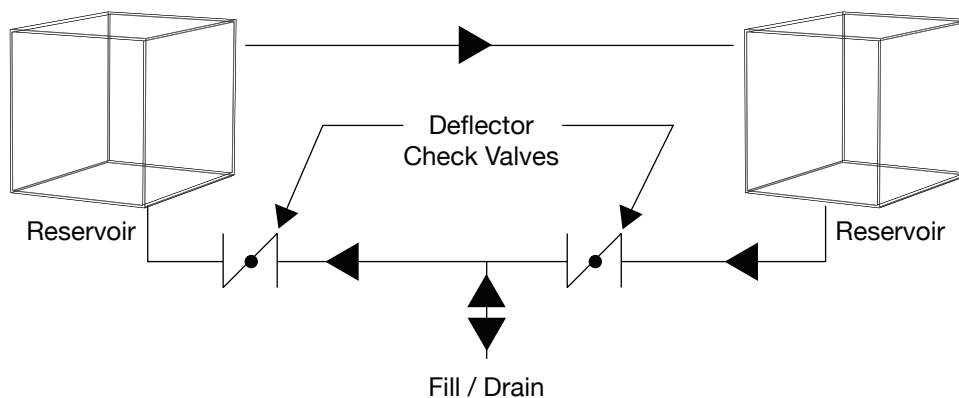


Cv Values

Valve Size		90°	80°	70°	60°	50°	40°	30°	20°	10°
Inches	mm	Open	Open	Open	Open	Open	Open	Open	Open	Open
12	300	11100	7500	4220	2450	1720	1100	620	310	90
14	350	14980	9420	5310	3120	2020	1330	810	380	115
16	400	18920	11420	9200	4300	2820	1825	1180	490	140
18	450	21640	15420	11050	5600	3500	2200	1350	580	190
20	500	24573	19941	13789	7573	4990	2953	1755	695	210
24	600	36469	28817	20059	11702	7658	4499	2626	1131	275
30	750	57687	45583	31728	19175	12461	7505	4385	1817	445
36	900	84798	63247	44095	26556	17129	10377	6530	3053	784
42	1050	113288	88426	60042	37117	23111	13777	8667	3852	830
48	1200	146177	115506	77474	46484	29966	18031	11402	5116	1084
54	1350	185570	146634	98352	59011	38041	22890	14474	6494	1377
60	1500	209000	163240	112200	66992	43340	25970	15950	7040	1569

Ordering Chart

Type	Size		Style		Material of Construction				Coating		Actuator		Indication	
	1	2	W		Body	Disc	Shaft	Seat	4		3		1	
Model	Size	Code	Style	Code	Material	Code	Coating	Code	Actuator	Code	Type	Code		
ECV	24"	24	Wafer	W	Body: A-36 Carbon Steel	1	Fused	1	Gear	1	Proximity	1		
	30"	30	Flanged	F	316 SS	2	Epoxy		Twin Lever	2	Mechanical	2		
	36"	36	Wafer x	WF	Special	3	Powder	2	Twin Weight	3				
	42"	42	Flanged				Coating		Manual	4				
	48"	48	Flanged	FP	Disc: A-36 Carbon Steel	1	NSF Epoxy	3	Declutchable					
	54"	54	x Plain End		316 SS	2	No Coating	4	Override					
	60"	60	Flanged	FV	Special	3								
			x Victaulic		Shaft: 316 SS	1								
			Victaulic	VV	17-4 PH	2								
			x Victaulic		Seat: A-36 Carbon Steel	1								
					316SS	2								
					EPDM	3								
				Viton	4									



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