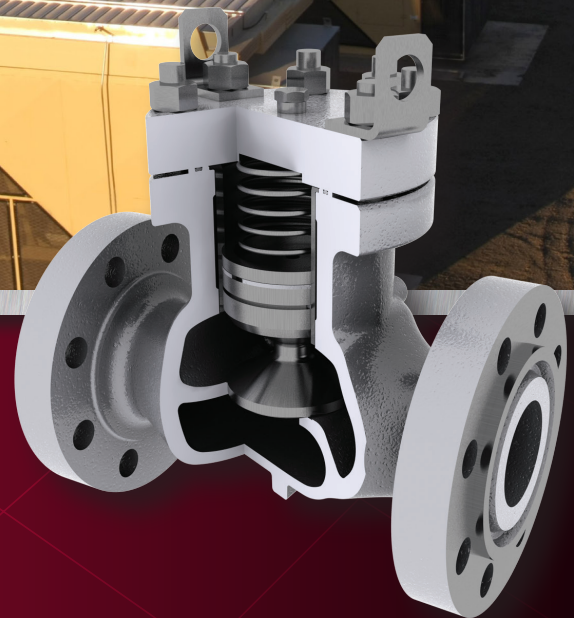


# TOM WHEATLEY Piston Check Valves

Designed to safely prevent backflow, preventing damage to pumps and compressors

TECHNOLOGY



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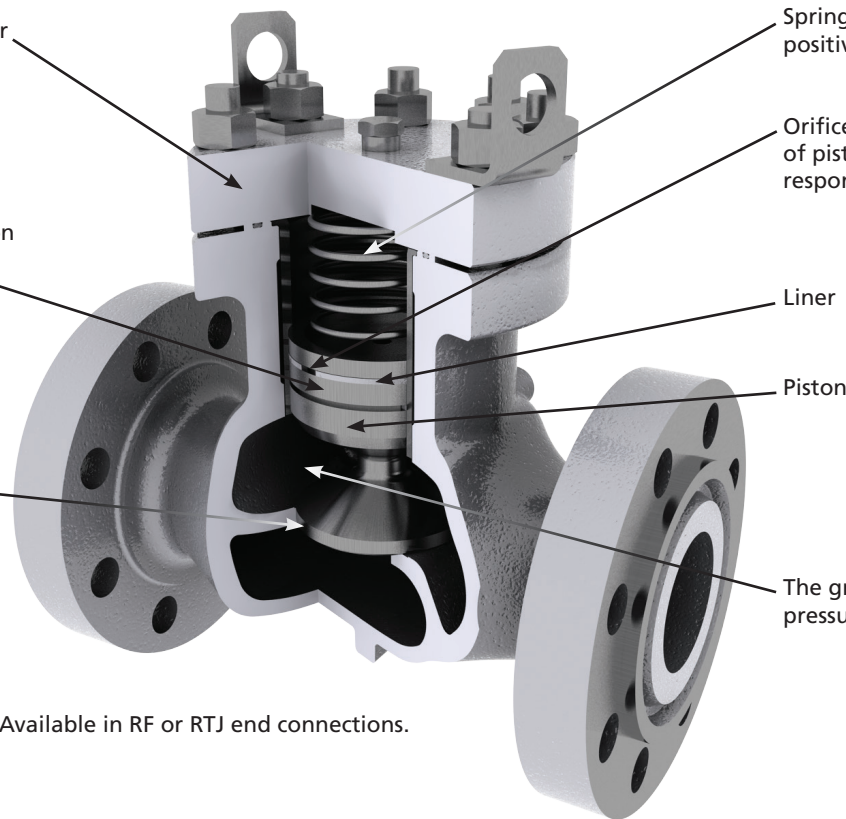
# TOM WHEATLEY Piston Check Valves

## FEATURES

Easy access to all valve internal parts through cover

Ball check valve inside piston allows quick opening

Integral or removable seat designs available; metal overlays also are available



Spring provides positive closure

Orifice controls closing speed of piston, dampening piston response to changes in flow

Liner

Piston

The greater the backflow pressure, the tighter the seal

Available in RF or RTJ end connections.

When pressure surges and pulsations are prevalent in a flow system, Cameron's TOM WHEATLEY® piston check valves are an efficient solution to system protection.

Due to a unique non-slam design, TOM WHEATLEY piston check valves have provided years of uninterrupted service downstream from reciprocating pumps and compressors, and in other applications where conventional check valve designs would be subjected to excessive wear. In addition, the TOM WHEATLEY piston check valve top entry design allows for easy access and replacement of all valve internal parts with reduced downtime.

### Smooth, Reliable Prevention of Backflow

In the absence of pressure differential, a TOM WHEATLEY piston check valve rests in the closed position due to gravity and spring force. Pressure on the upstream end of the valve lifts the piston off the seat and allows flow. As flow varies, the piston of the TOM WHEATLEY piston check valve floats within a cylinder. Should the flow cease, the piston lowers and seats to create a bubble-tight prevention of backflow.

A ball check mechanism and an adjacent orifice within the piston help to extend valve life by dampening piston movement and eliminating slamming or chattering in the event of sudden pressure surges or erratic flow conditions.

The orifice size affects the degree of piston movement and is optimally selected at the factory to meet the requirements of a specified flow range.

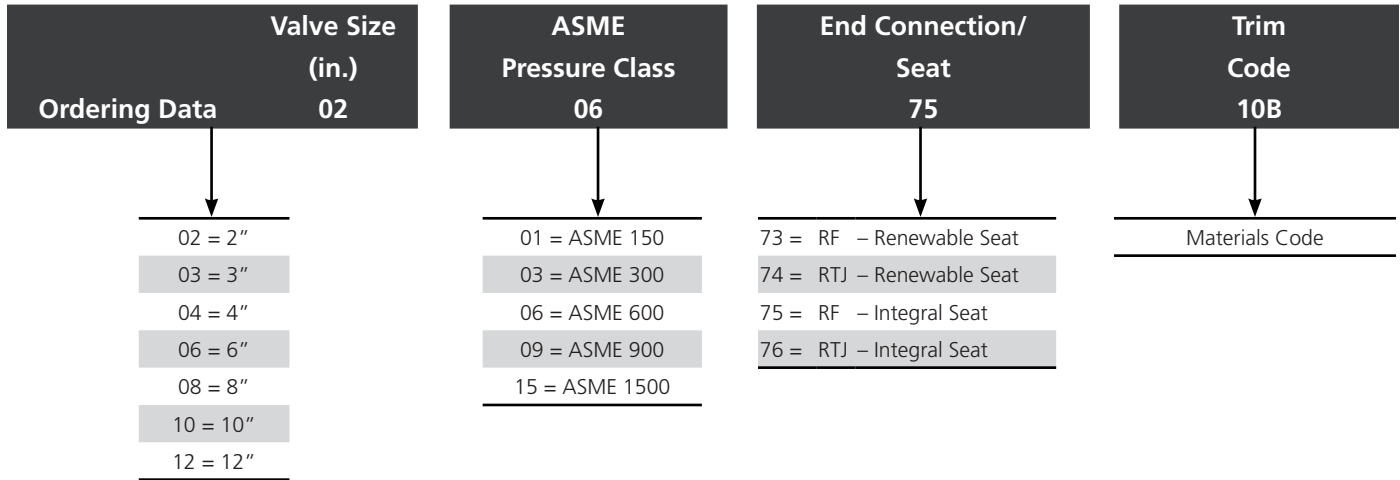
The TOM WHEATLEY piston check valve is available with the following features:

- Soft seal
- Metal-to-metal seal
- Renewable seat
- A variety of body and trim materials

As a result of the piston and seat design, the greater the backpressure acting on the piston, the tighter the seal.

TOM WHEATLEY piston check valves comply with API 6D/ ISO 14313, ASTM B 16.34 and NACE MR0175/ISO 15156, and all TOM WHEATLEY piston check valves are designed for horizontal service. TOM WHEATLEY piston check valves must be ordered specifically for vertical flow when intended for that service.

## HOW TO ORDER



Materials Code – See standard materials of constructions.

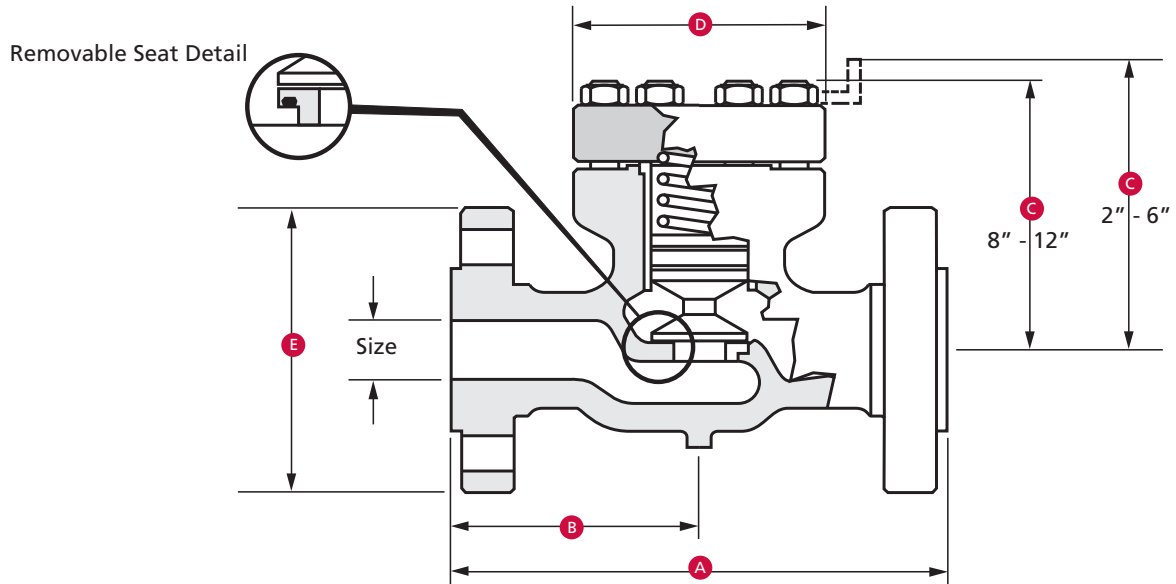
Note: The alpha character represents the seal material code.

Body	ASTM A216 Gr. WCC
Cover	A516 Gr. 70
Cover Seal	Buna-N
Bolting	ASTM A193 Gr. B7, ASTM A194 Gr. 2H
Liner	ASTM A29-1018 with ENP
Piston	410 Stainless Steel
Piston Seal	Buna-N
Seat	Integral
Piston Rings	Cast Iron

Note: Other materials of construction and seals are available upon request.

# ASME Class 150-1500, 2" through 12"

## DIMENSIONS



Nominal Size in. (mm)	ASME Class	A (RF)	A (RTJ)	B	C	D	E
2 (50)	150	10.50 (267)*	11.13 (283)*	5.25 (134)	9.25 (235)	7.00 (178)	6.00 (152)
	300	10.50 (267)	11.13 (283)	5.25 (134)	9.25 (235)	7.00 (178)	6.50 (165)
	600	11.50 (292)	11.63 (295)	5.75 (146)	9.50 (241)	7.00 (178)	6.50 (165)
	900	14.50 (368)	14.63 (372)	7.25 (184)	10.00 (254)	7.63 (194)	8.50 (216)
	1500	14.50 (368)	14.63 (372)	7.25 (184)	10.25 (260)	7.63 (194)	8.50 (216)
3 (80)	150	12.50 (318)*	13.13 (334)*	6.25 (159)	10.75 (273)	8.25 (210)	7.50 (191)
	300	12.50 (318)	13.13 (334)	6.25 (159)	10.75 (273)	8.25 (210)	8.25 (210)
	600	14.00 (356)	14.13 (359)	7.00 (178)	11.13 (283)	8.25 (210)	8.25 (210)
	900	15.00 (381)	15.13 (384)	7.50 (191)	11.38 (289)	8.25 (210)	9.50 (241)
	1500	18.50 (470)	18.63 (473)	9.25 (235)	13.13 (334)	11.63 (295)	10.50 (267)
4 (100)	150	14.00 (356)*	14.63 (372)*	7.00 (178)	11.50 (292)	9.75 (248)	9.00 (229)
	300	14.00 (356)	14.63 (372)	7.00 (178)	11.50 (292)	9.75 (248)	10.00 (254)
	600	17.00 (432)	17.13 (435)	8.50 (216)	11.88 (302)	9.75 (248)	10.75 (273)
	900	18.00 (457)	18.13 (461)	9.00 (229)	12.37 (314)	9.75 (248)	11.50 (292)
	1500	21.50 (546)	21.63 (549)	10.75 (273)	13.00 (330)	10.75 (273)	12.25 (311)
6 (150)	150	17.50 (445)*	18.13 (461)*	8.75 (223)	16.38 (416)	11.75 (298)	11.00 (279)
	300	17.50 (445)	18.13 (461)	8.75 (223)	16.38 (416)	11.75 (298)	12.50 (318)
	600	22.00 (559)	22.13 (562)	11.00 (280)	17.07 (434)	12.25 (311)	14.00 (356)
	900	24.00 (610)	24.13 (613)	12.00 (305)	17.25 (438)	11.75 (298)	15.00 (381)
	1500	27.75 (705)	28.00 (711)	13.88 (353)	15.75 (400)	13.13 (334)	15.50 (394)
8 (200)	150	19.50 (495)	20.00 (508)	9.75 (248)	13.00 (330)	14.75 (375)	13.50 (343)
	300	21.00 (533)	21.63 (549)	10.50 (267)	13.88 (352)	14.75 (375)	17.50 (445)
	600	26.00 (660)	26.13 (664)	13.00 (330)	14.88 (378)	14.75 (375)	16.50 (419)
	900	29.00 (737)	29.13 (740)	14.50 (368)	15.13 (384)	14.69 (373)	18.50 (470)
10 (250)	150	24.50 (622)	25.00 (635)	12.25 (311)	15.38 (391)	17.50 (445)	16.00 (406)
	300	24.50 (622)	25.13 (638)	12.25 (311)	15.38 (391)	17.50 (445)	17.50 (445)
	600	31.00 (787)	31.13 (791)	15.50 (394)	16.38 (416)	17.50 (445)	20.00 (508)
	900	33.00 (838)	33.13 (842)	16.50 (419)	16.88 (429)	17.50 (445)	21.50 (546)
12 (300)	150	27.50 (699)	28.00 (711)	13.75 (349)	18.50 (470)	21.00 (533)	19.00 (483)
	300	28.00 (711)	28.63 (727)	14.00 (356)	18.50 (470)	21.00 (533)	20.50 (521)
	600	33.00 (838)	33.13 (842)	16.50 (419)	18.26 (464)	21.00 (533)	22.00 (559)
	900	38.00 (965)	38.13 (969)	19.00 (483)	19.13 (486)	21.00 (533)	24.00 (610)

\* Length exceeds dimensions given in API 6D/ISO 14313.

## MATERIALS OF CONSTRUCTION

Components	US Standard Trim 10 "X" "X"	Canada Standard Trim 12 "X" "X"	Stainless Steel Trim 20 "X" "X"	Full Stainless Trim 30 "X" "X"	Metal-to-Metal Trim 40 "X" "X"	Stellite™ Facing Seat/Piston Trim 50 "X" "X"
Body	A216-WCC	A352-LCC	A216-WCC	A351-CF8M	A216-WCC	A216-WCC
Cover	ASTM A515 Gr. 70	ASTM A516 Gr. 70	ASTM A515 Gr. 70	A240-316	ASTM A515 Gr. 70	ASTM A515 Gr. 70
Cover Seal	See Note 1	See Note 1	See Note 1	See Note 1	See Note 1	See Note 1
Bolting	A193 Gr. B7 A194 Gr. 2H	A320 Gr. L7M A194 Gr. 7M	A193 Gr. B7 A194 Gr. 2H	A193 Gr. B7M A194 Gr. 8M	A193 Gr. B7 A194 Gr. 2H	A193 Gr. B7 A194 Gr. 2H
Liner	A29-1018 ENP	A29-1018 ENP	A29-1018 ENP	A29-1018 ENP	A29-1018 ENP	A29-1018 ENP
Piston	410 SS	410 SS	410 SS	410 SS	410 SS	410 SS w/Stellite #6 Hard Face
Piston Seal	See Note 1	See Note 1	See Note 1	See Note 1	n/a	See Note 1
Seat Integral	A216-WCC	A352-LCC	n/a	A351-CF8M	n/a	n/a
Seat Renewable	Carbon Steel	Carbon Steel	316 SS	316 SS	Carbon Steel	410 SS w/Stellite #6 Hard Face
Piston Rings	Cast Iron	Cast Iron	Cast Iron	Cast Iron ENP	Cast Iron	Cast Iron
Piston Spring	Alloy X-750	Alloy X-750	Alloy X-750	Alloy X-750	Alloy X-750	Alloy X-750

### Notes:

- In the trim number description, "X" "X" relates to the cover and piston seal material options. When ordering, replace the first "X" with the cover seal from the list below. Use the second "X" only when the piston seal is different from the cover seal (i.e., VM for FKM (Viton®) cover seal and metal-to-metal piston seal).

B = Buna-N

V = FKM (Viton)

T = Teflon®

M = Metal-to-metal\*

H = HSN

F = Fiber gasket

A = AFLAS

\* Not available in fig. 75 or 76

Other seal material options are available upon request.

2. N/A = Not available

3. ENP = Electroless nickel plated

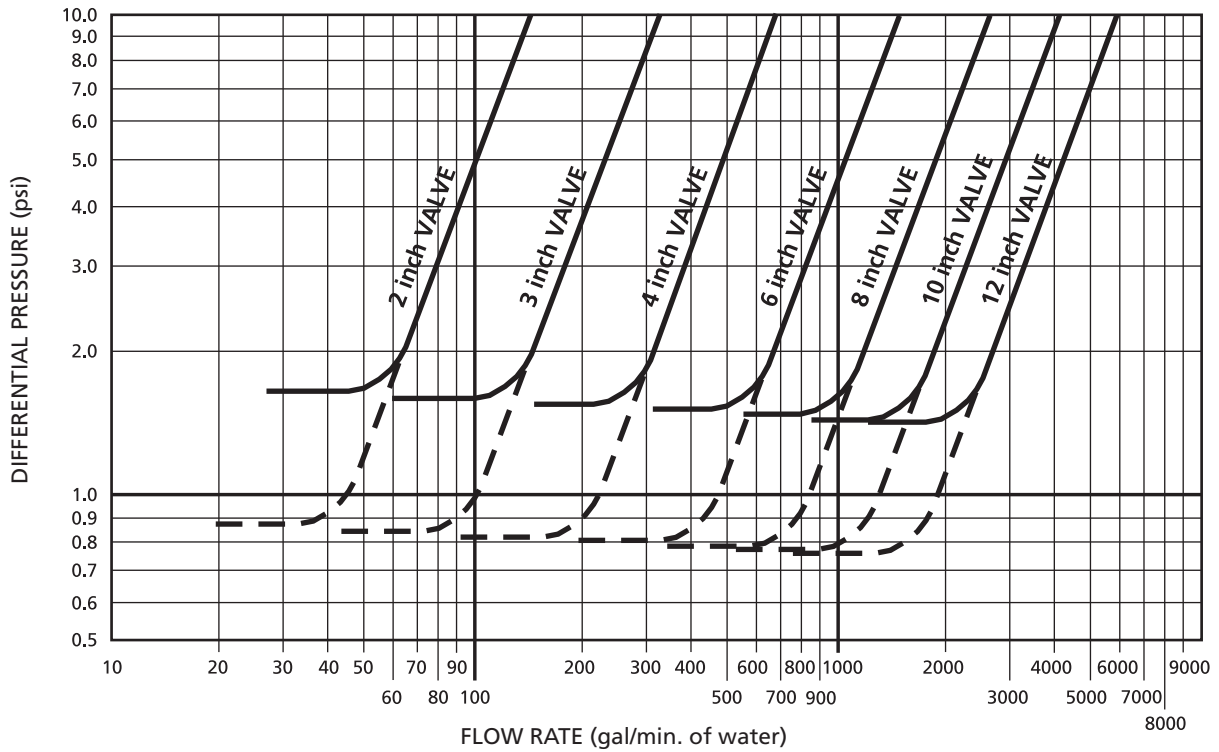
4. EHC = Engineered hard chrome plating

5. Materials comply with NACE MR0175/ISO 15156

6. Other materials are available upon request

# PRESSURE-LOSS CURVES/FLOW COEFFICIENTS

## Pressure-loss Curves



Dotted lines represent pressure loss for valves without springs.

## Flow Coefficients

### Flow Coefficients ( $C_v$ ) Full Open Valves

Valve Size	$C_v$
2	46
3	104
4	212
6	477
8	848
10	1325
12	1908

### Liquid (incompressible flow)

The equations listed below are the basis for the above nomogram. The nomogram is a method for solving the equations below quickly and simply when service fluid is water.

$$C_v = Q \sqrt{\frac{G}{\Delta P}} \qquad Q = C_v \sqrt{\frac{\Delta P}{G}} \qquad \Delta P = \left[ \frac{Q}{C_v} \right]^2 G$$

Where:

- Q = FLOW: LIQUIDS – gal/min  
GASES – cf/hour
- $C_v$  = FLOW COEFFICIENT
- $P_1$  = INLET PRESSURE (psia)
- $P_2$  = OUTLET PRESSURE (psia)
- $\Delta P$  = PRESSURE DROP ( $P_1 - P_2$ )
- T = ABSOLUTE TEMPERATURE ( $^{\circ}F + 460$ )
- G = SPECIFIC GRAVITY (WATER = 1)

### Gas (compressible flow)

$$C_v = \frac{Q}{963} \sqrt{\frac{GT}{P_1^2 - P_2^2}}$$

$$Q = C_v 963 \sqrt{\frac{P_1^2 - P_2^2}{GT}}$$

3250 Briarpark Drive, Suite 300

Houston, TX 77042

USA

Toll Free 1.800.323.9160

Learn more about TOM WHEATLEY piston check valves at:

[www.c-a-m.com/TOMWHEATLEY](http://www.c-a-m.com/TOMWHEATLEY)

[TOMWHEATLEY@c-a-m.com](mailto:TOMWHEATLEY@c-a-m.com)



#### **HSE Policy Statement**

At Cameron, we are committed ethically, financially and personally to a working environment where no one gets hurt and nothing gets harmed.