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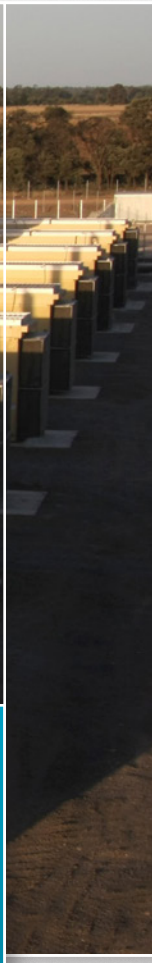
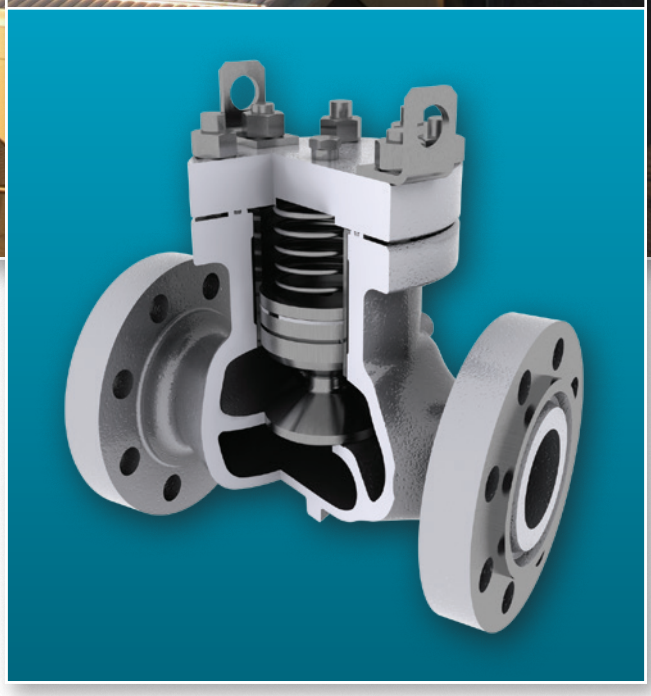




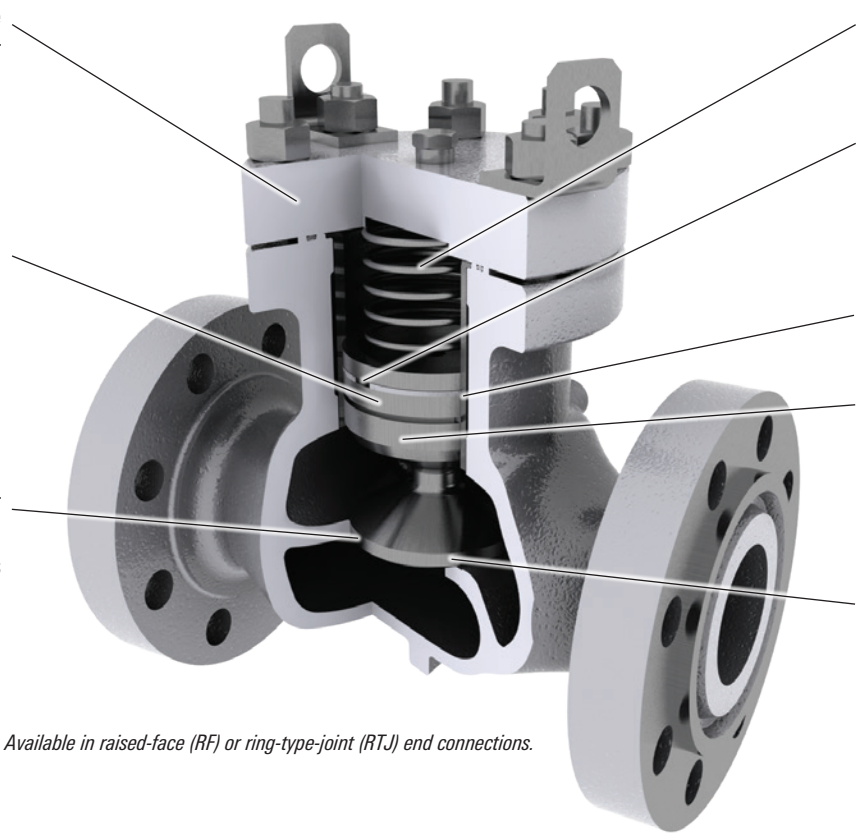
Piston-Style TOM WHEATLEY Check Valves

Protecting pumps and compressors from damaging backflow

Contents

Piston-style TOM WHEATLEY check valves

Features



Available in raised-face (RF) or ring-type-joint (RTJ) end connections.

When pressure surges and pulsations are prevalent in a flow system, TOM WHEATLEY* check valves offer efficient system protection.

Due to a unique nonslam design, piston-style TOM WHEATLEY 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 piston-style TOM WHEATLEY check valve top-entry design enables easy access and replacement of all valve internal parts with reduced downtime.

Smooth, reliable prevention of backflow

In the absence of differential pressure, a piston-style TOM WHEATLEY check valve rests in the closed position because of gravity and spring force. Pressure on the upstream end of the valve lifts the piston off the seat and enables flow. As flow varies, the piston of the TOM WHEATLEY 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 piston-style TOM WHEATLEY check valve is available with the following features:

- soft seal
- metal-to-metal seal
- renewable seat
- 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.

These piston-style check valves comply with API Spec 6D, ASTM Standard B16.34, and NACE MR0175/ISO 15156, and all TOM WHEATLEY check valves are designed for horizontal service. They must be ordered specifically for vertical flow when intended for that service.

How to Order

02067510B: 2-in, ASME 600, raised-face end connection with integral seat, US standard trim 10, Buna-N cover and piston seals material

Example

02 06 75 10 B M

Valve Size	
Code	**Description**
02	2 in
03	3 in
04	4 in
06	6 in
08	8 in
10	10 in
12	12 in

ASME Pressure Class	
Code	**Description**
01	ASME 150
03	ASME 300
06	ASME 600
09	ASME 900
15[†]	ASME 1500

[†] Available only for 2–6 in.

End Connection/Seat	
Code	**Description**
73	RF/renewable seat
74	RTJ/renewable seat
75	RF/integral seat
76	RTJ/integral seat

Trim Code	
Code	**Description**
10	US standard trim 10
12	Canada standard trim 12
20	Stainless steel trim 20
30	Full stainless trim 30
40	Metal-to-metal trim 40
50	Stellite™ facing seat/ piston trim 50

Seal	
Code	**Description**
A	AFLAS®
B	Buna-N
H	Highly saturated nitrile (HSN)
V	FKM (Viton®)

Piston Seal[‡]	
Code	**Description**
M	Metal-to-metal[§]

[‡] Use only when the piston seal requires metal-to-metal material.

[§] Not available in integral-seat design.

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 Grade 70	ASTM A516 Grade 70	ASTM A515 Grade 70	A240-316	ASTM A515 Grade 70	ASTM A515 Grade 70
Cover seal	See note 1	See note 1	See note 1	See note 1	See note 1	See note 1
Bolting[†]	A193 Grade B7	A320 Grade L7M	A193 Grade B7	A193 Grade B7M	A193 Grade B7	A193 Grade B7
	A194 Grade 2H	A194 Grade 7M	A194 Grade 2H	A194 Grade 8M	A194 Grade 2H	A194 Grade 2H
Liner	A29-1018 electroless nickel plated (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 with 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 with 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

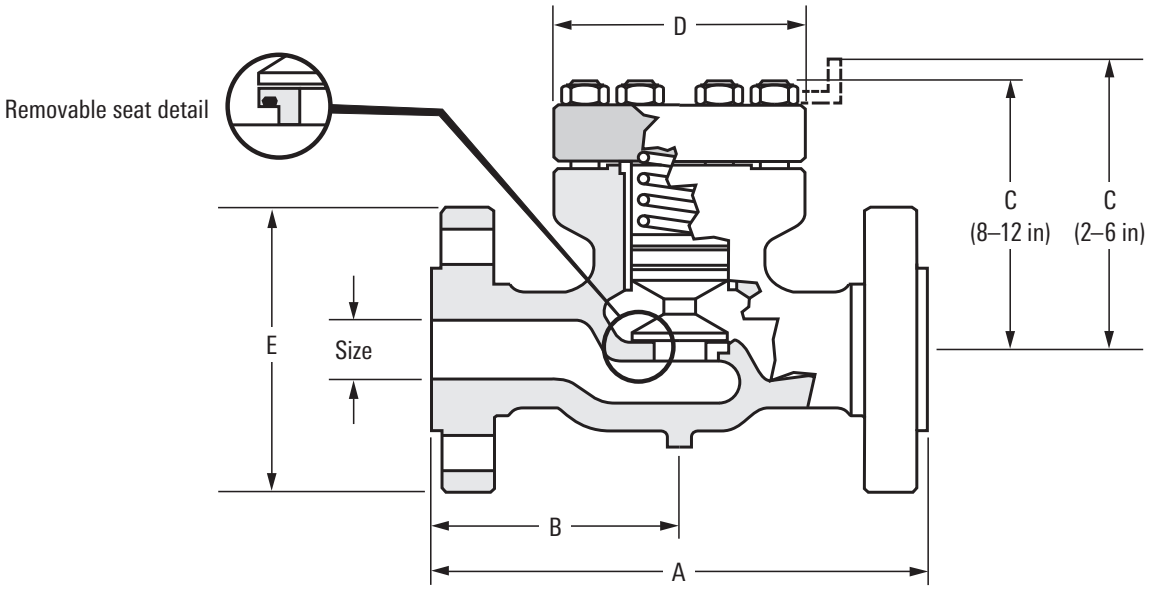
[†] Alternative equivalent bolting of L7M and 7M may be supplied.

Note 1: 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 above.
Use the second "X" only when the piston seal requires metal-to-metal option.

N/A—Not available.
Materials comply with NACE MR0175/ISO 15156.
Other materials available upon request.

Dimensions

ASME Class 150–1500, 2–12 in

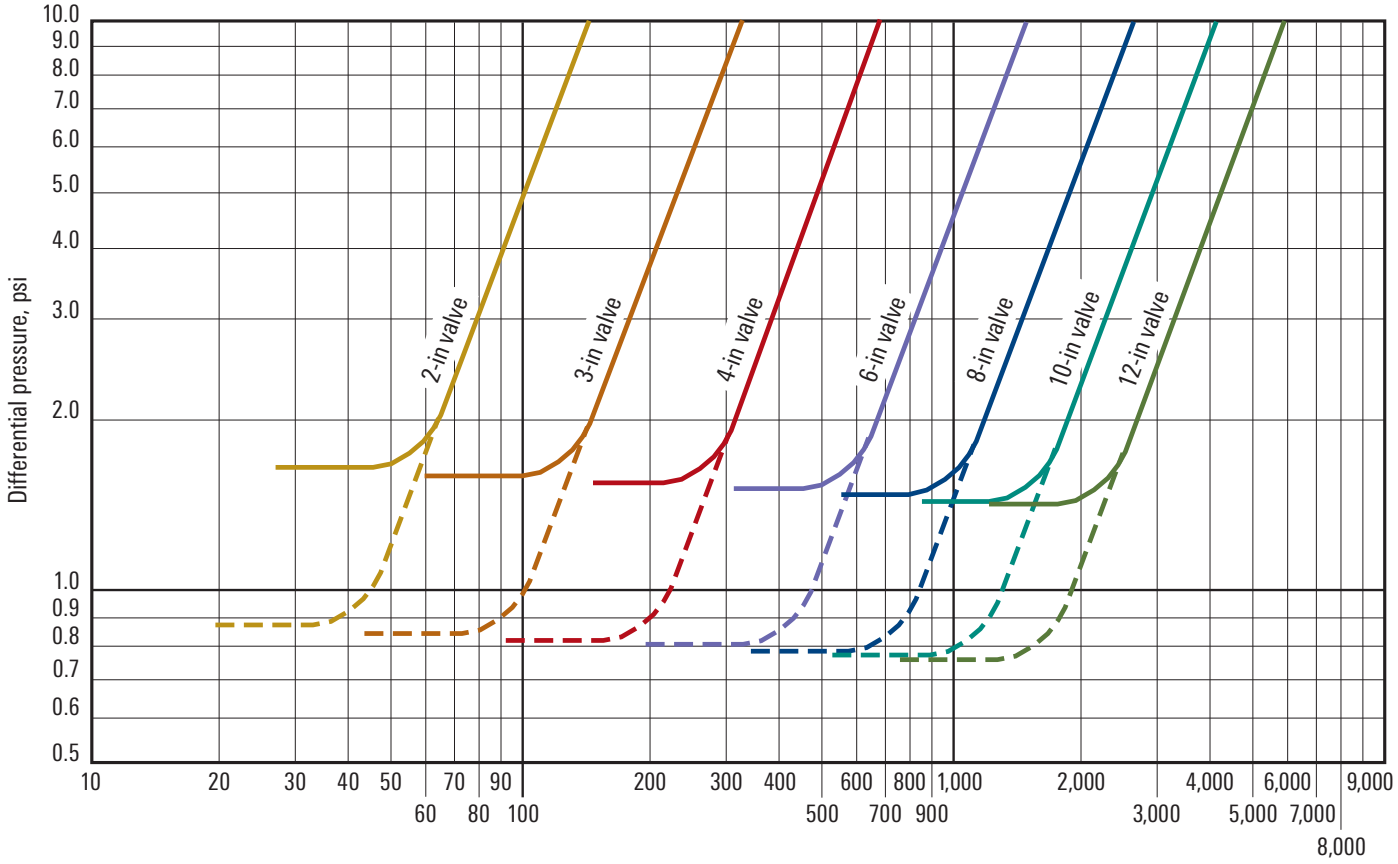


Nominal size, in [mm]	ASME Class	A (RF), in [mm]	A (RTJ), in [mm]	B, in [mm]	C, in [mm]	D, in [mm]	E, in [mm]
2 [50]	150	10.50 [267]†	11.13 [283]†	5.25 [134]	9.25 [235]	7.00 [178]	6.00 [152]
	300	10.50 [267]	11.13 [283]	5.25 [134]	9.25 [235]	7.00 [178]	6.50 [165]
	600	11.50 [292]	11.63 [295]	5.75 [146]	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.

Pressure-Loss Curves and 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, in	**C_v**
2	46
3	104
4	212
6	477
8	848
10	1,325
12	1,908

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.

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

Gas (Compressible Flow)

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

Where

Q = Flow (liquids — galUS/min, gases — ft^3/h)

C_v = Flow coefficient

P_1 = Inlet pressure, psi (absolute)

P_2 = Outlet pressure, psi (absolute)

ΔP = Pressure drop (P_1–P_2)

T = Absolute temperature (460 degF)

G = Specific gravity (water = 1)

Notes

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