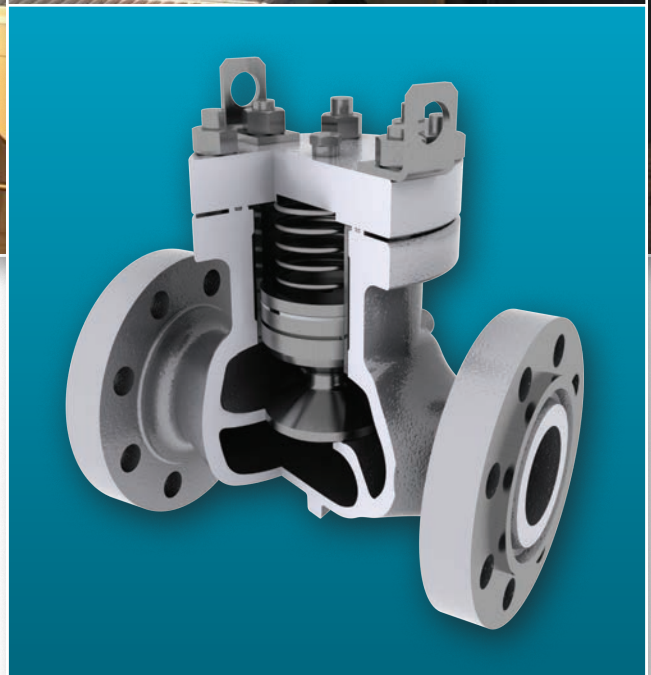




Piston-Style TOM WHEATLEY Check Valves

Protecting pumps and compressors
from damaging backflow

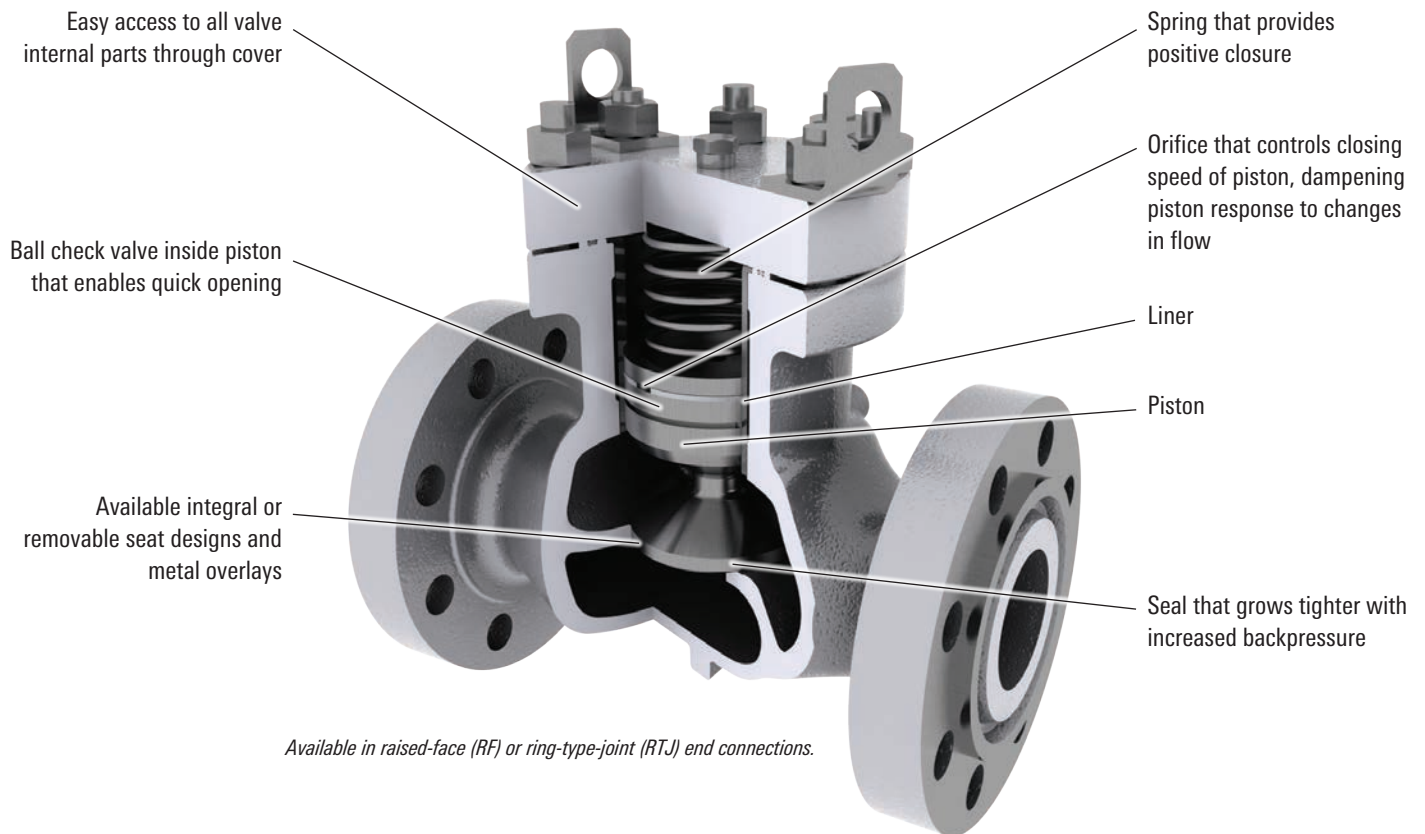


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Piston-style TOM WHEATLEY check valves

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Features



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, other certifications such as PED/CE and CRN available upon request. 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		ASME Pressure Class		End Connection/Seat		Trim Code		Seal		Piston Seal [†]	
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
02	2 in	01	ASME 150	73	RF/renewable seat	10	US standard trim 10	A	AFLAS®	M	Metal-to-metal [§]
03	3 in	03	ASME 300	74	RTJ/renewable seat	12	Canada standard trim 12	B	Buna-N		
04	4 in	06	ASME 600	75	RF/integral seat	20	Stainless steel trim 20	H	Highly saturated nitrile (HSN)		
06	6 in	09	ASME 900	76	RTJ/integral seat	30	Full stainless trim 30	V	FKM (Viton®)		
08	8 in	15 [†]	ASME 1500			50	Stellite™ facing seat/piston trim 50				
10	10 in					61	ZPEX coating trim 61				
12	12 in										

[†] Available only for 2–6 in.

[‡] 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"	Stellite Facing Seat/Piston Trim 50 "X" "X"	ZPEX Coating Trim 61 "X" "X"
Body	A216-WCC	A352-LCC	A216-WCC	A351-CF8M	A216-WCC	A216-WCC/ZPEX
Cover	ASTM A515 Grade 70	ASTM A516 Grade 70	ASTM A515 Grade 70	A240-316	ASTM A515 Grade 70	ASTM A515 Grade 70/ZPEX
Cover seal	See note 1	See note 1	See note 1	See note 1	See note 1	See note 1
Bolting [†]	A193 Grade L7M	A193 Grade L7M	A193 Grade L7M	A193 Grade L7M	A193 Grade L7M	A193 Grade L7M
	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	316 SS	410 SS	316 SS	410 SS with Stellite #6 hard face	410 SS
Piston seal	See note 1	See note 1	See note 1	See note 1	See note 1	See note 1
Seat integral	A216-WCC	A352-LCC	N/A	A351-CF8M	N/A	A216-WCC/ZPEX
Seat renewable	Carbon steel	Carbon steel	316 SS	316 SS	410 SS with Stellite #6 hard face	Carbon steel/ZPEX
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.

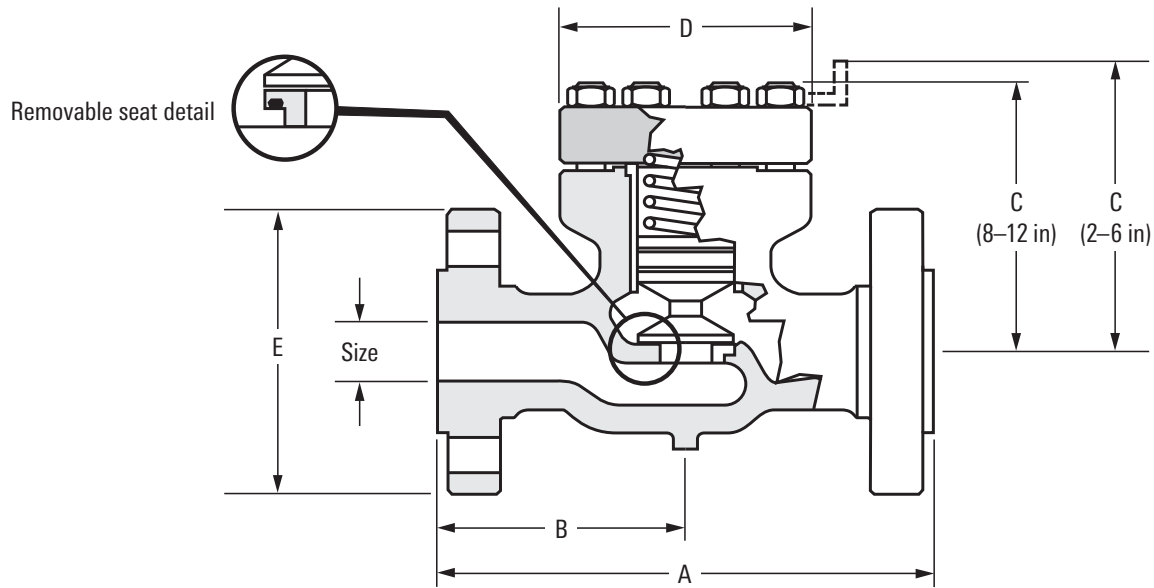
N/A—Not available.

Materials comply with NACE MR0175/ISO 15156.

Other materials available upon request.

Dimensions

ASME Class 150–1500, 2–12 in



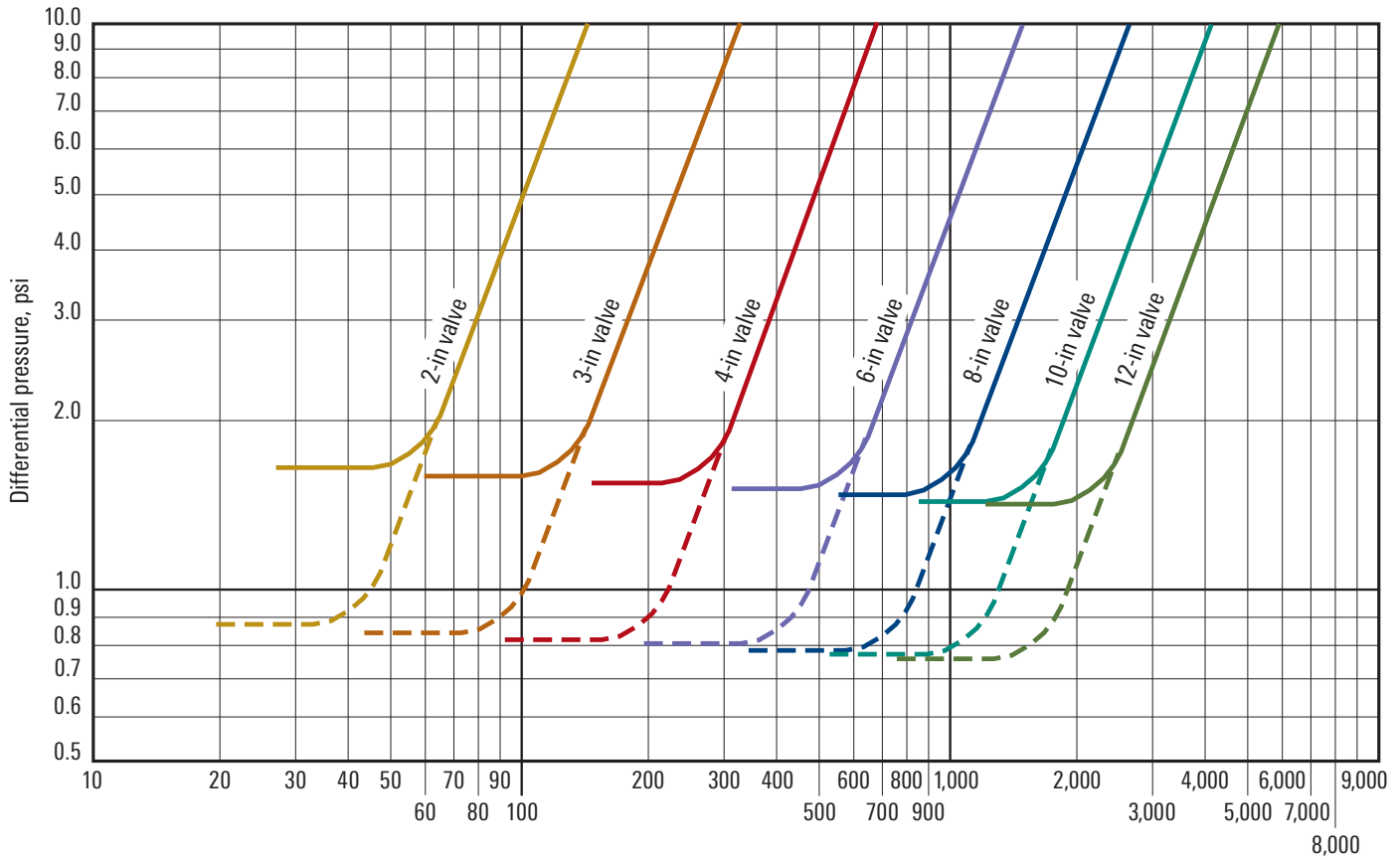
Nominal Size, in [mm]	ASME Class	Working Pressure, psi	Weight, lbm	A (RF), in [mm]	A (RTJ), in [mm]	B, in [mm]	C, [†] in [mm]	D, in [mm]	E, in [mm]
2 [50]	150	290	61	10.50 [267] [‡]	11.13 [283] [‡]	5.25 [134]	9.25 [235]	7.00 [178]	6.00 [152]
	300	750	63	10.50 [267]	11.13 [283]	5.25 [134]	9.25 [235]	7.00 [178]	6.50 [165]
	600	1,500	69	11.50 [292]	11.63 [295]	5.75 [146]	9.50 [241]	7.00 [178]	6.50 [165]
	900	2,250	13	14.50 [368]	14.63 [372]	7.25 [184]	10.00 [254]	7.63 [194]	8.50 [216]
	1500	3,750	136	14.50 [368]	14.63 [372]	7.25 [184]	10.25 [260]	7.63 [194]	8.50 [216]
3 [80]	150	290	96	12.50 [318] [‡]	13.13 [334] [‡]	6.25 [159]	10.75 [273]	8.25 [210]	7.50 [191]
	300	750	104	12.50 [318]	13.13 [334]	6.25 [159]	10.75 [273]	8.25 [210]	8.25 [210]
	600	1,500	116	14.00 [356]	14.13 [359]	7.00 [178]	11.13 [283]	8.25 [210]	8.25 [210]
	900	2,250	151	15.00 [381]	15.13 [384]	7.50 [191]	11.38 [289]	8.25 [210]	9.50 [241]
	1500	3,750	344	18.50 [470]	18.63 [473]	9.25 [235]	13.13 [334]	11.63 [295]	10.50 [267]
4 [100]	150	290	137	14.00 [356] [‡]	14.63 [372] [‡]	7.00 [178]	11.50 [292]	9.75 [248]	9.00 [229]
	300	750	152	14.00 [356]	14.63 [372]	7.00 [178]	11.50 [292]	9.75 [248]	10.00 [254]
	600	1,500	202	17.00 [432]	17.13 [435]	8.50 [216]	11.88 [302]	9.75 [248]	10.75 [273]
	900	2,250	244	18.00 [457]	18.13 [461]	9.00 [229]	12.37 [314]	9.75 [248]	11.50 [292]
	1500	3,750	387	21.50 [546]	21.63 [549]	10.75 [273]	13.00 [330]	10.75 [273]	12.25 [311]
6 [150]	150	290	386	17.50 [445] [‡]	18.13 [461] [‡]	8.75 [223]	16.38 [416]	11.75 [298]	11.00 [279]
	300	750	317	17.50 [445]	18.13 [461]	8.75 [223]	16.38 [416]	11.75 [298]	12.50 [318]
	600	1,500	518	22.00 [559]	22.13 [562]	11.00 [280]	17.07 [434]	12.25 [311]	14.00 [356]
	900	2,250	502	24.00 [610]	24.13 [613]	12.00 [305]	17.25 [438]	11.75 [298]	15.00 [381]
	1500	3,750	966	27.75 [705]	28.00 [711]	13.88 [353]	15.75 [400]	13.13 [334]	15.50 [394]
8 [200]	150	290	350	19.50 [495]	20.00 [508]	9.75 [248]	13.00 [330]	14.75 [375]	13.50 [343]
	300	750	380	21.00 [533]	21.63 [549]	10.50 [267]	14.10 [358]	14.75 [375]	17.50 [445]
	600	1,500	698	26.00 [660]	26.13 [664]	13.00 [330]	14.88 [378]	14.75 [375]	16.50 [419]
	900	2,250	931	29.00 [737]	29.13 [740]	14.50 [368]	15.33 [389]	14.69 [373]	18.50 [470]
10 [250]	150	290	500	24.50 [622]	25.00 [635]	12.25 [311]	15.38 [391]	17.50 [445]	16.00 [406]
	300	750	600	24.50 [622]	25.13 [638]	12.25 [311]	15.38 [391]	17.50 [445]	17.50 [445]
	600	1,500	1,184	31.00 [787]	31.13 [791]	15.50 [394]	16.38 [416]	17.50 [445]	20.00 [508]
	900	2,250	1,464	33.00 [838]	33.13 [842]	16.50 [419]	16.88 [429]	17.50 [445]	21.50 [546]
12 [300]	150	290	700	27.50 [699]	28.00 [711]	13.75 [349]	18.50 [470]	21.00 [533]	19.00 [483]
	300	750	850	28.00 [711]	28.63 [727]	14.00 [356]	18.50 [470]	21.00 [533]	20.50 [521]
	600	1,500	1,757	33.00 [838]	33.13 [842]	16.50 [419]	18.26 [464]	21.00 [533]	22.00 [559]
	900	2,250	2,256	38.00 [965]	38.13 [969]	19.00 [483]	19.13 [486]	21.00 [533]	24.00 [610]

[‡] Sizes 2 to 6 in with eye lid; sizes 8 to 12 in with eye bolt.

[†] Length exceeds dimensions given in API Spec 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.

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

Gas (compressible flow)

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

Where

Q = Flow (liquids— galUS/min, gases— ft³/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

Piston-Style TOM WHEATLEY Check Valves



slb.com/valves

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