CAMERON

TBV Series 5500 Double Block-and-Bleed Ball Valves

A two-closure-member valve system that provides redundant sealing in critical areas for increased personnel safety

TECHNOLOGY

TBV Series 5500 Double Block-and-Bleed Ball Valves

Millbury, Mass., USA

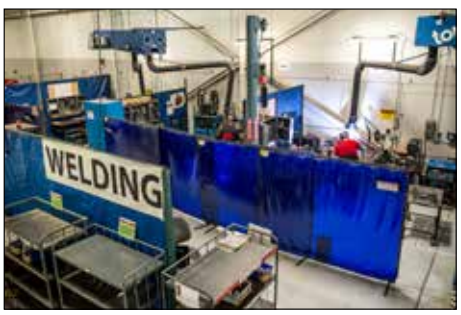
Cameron is a leading provider of valves, valve automation, and measurement systems to the oil and gas industry. Our products are used primarily to control, direct, and measure the flow of oil and gas as it is moved from individual wellheads through flowlines, gathering lines, and transmission systems to refineries, petrochemical plants, and industrial centers for processing.

We provide critical service valves for refinery, chemical, and petrochemical processing businesses, and for associated storage terminal applications, particularly through our ORBIT® and GENERAL VALVE® product lines. These brands are complemented by our WKM® and TBV™ valve products, and considerably expand the scope of our product offerings.

TBV valve products are manufactured and assembled at Cameron's facility in Millbury, Mass. This facility offers 68,600 sq ft of space, of which, 52,160 sq ft is dedicated to manufacturing, assembling, testing, shipping, and quality assurance. The manufacturing space allows us to expand our product offerings and size range. Our TBV valves are competitive in the LNG, mining, and petrochemical markets, with the added ability to offer larger size ranges within this product line.

Facility Features

- Clean room for oxygen, chlorine, and phosgene assembly and testing
- Paint booth
- Dedicated cryogenic testing area
- State-of-the-art CNC machining
- In-house NDE capabilities – PMI, Ferrite testing, fugitive emissions testing, high-pressure gas testing, and LP examination
- Welding performed to provide a wide variety of configurations
- ASME-qualified welders



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TBV SERIES 5500 DOUBLE BLOCK-AND-BLEED BALL VALVES

TBV Series 5500 Double Block-and-Bleed Ball Valves

WHAT'S THE DIFFERENCE BETWEEN DOUBLE BLOCK-AND-BLEED AND DOUBLE ISOLATION-AND-BLEED?

The term double block-and-bleed (DBB) has been an ongoing debate in the oil and gas industry, mainly because there are two credible sources that define the term differently.

Basically, the difference is that API allows DBB to be one single valve with two unidirectional seats, while OSHA requires a DBB valve to be two individual valves in the same unit.

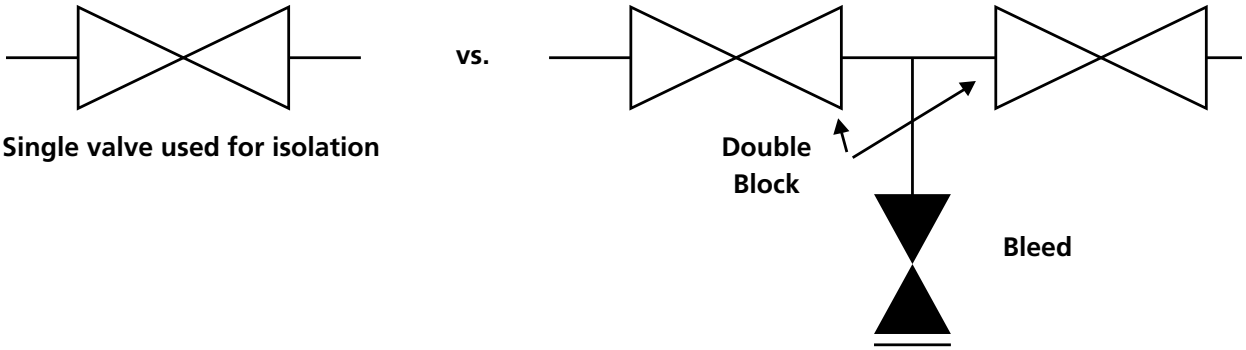
In one compact design, Cameron's TBV series 5500 DBB valve provides the two individual isolation valves required by OSHA.

Double isolation-and-bleed (DIB) is another term floating around the industry that makes the debate about DBB even more confusing. This feature can be provided in one direction or in both directions.

The difference between API's definition of DBB and DIB is that a DBB valve can seal against pressure from both sides of the valve, while a double isolation-and-bleed valve provides a seal against pressure from only one side.

Through a DBB or DIB valve, isolation can occur in both the upstream and downstream direction, even in high-pressure or high-temperature situations. Isolation is important in cases where environmental leakage could have major consequences.

When most people say they need a DBB valve, they're looking for a single valve (or valve system) with a compact design that provides more reliable sealing in critical areas than a traditional valve would.



OPERATING PRINCIPLE

ADVANTAGES

DBB and DIB valves:

- Save space
- Reduce the need for costly multi-valve systems
- Reduce weight
- Provide zero leakage capabilities from upstream to downstream
- Allow for easier flow diverting, sampling, or injection situations
- Allow for easier maintenance, especially for minor repairs under pressure
- Allow for integrity check of seat seals

Compact, double block-and-bleed design (prior to fire testing)

FEATURES AND BENEFITS

- Instrument and pipeline valves
- 1/2" to 3" (15 mm to 80 mm)
- Pressure Classes ASME 150 to 1500
- Fire-safe design available according to API 607 6th Ed.
- Stem design per API 608
- Flange-to-flange or flange-to-pipe connections available
- Various sealing materials available, including PTFE-to-metal
- Standard Materials of Construction*
  - WCB Carbon Steel
  - 316 Stainless Steel
  - Duplex
  - Others available upon request

During fire testing to API 607 6th Ed.

Markets						
Refining	LNG	Offshore Production	Chemical and Petrochemical	Gas	FPSO	Pipeline

Applications						
Primary Isolation	Chemical Injection	Sample Connections	Pressure Instrument Connections	Venting	Gas Separation	Pressure Equalization
		Gas Separation	Boiler Bridle Isolation	Emergency Shutdown (ESD)		

DOUBLE BLOCK-AND-BLEED KNOW-HOW

Challenge: A petrochemical company had a very difficult bromide application in a field in the southeastern US, where they wanted to use Cameron's TBV DBB critical service valves. Not only was INCONEL® 718 required for the valve body and internals, but these DBB valves had to be fabricated from wrought product and needed to operate in temperatures in excess of 1000° F (538° C) to prevent any possibility of acid formation when in the presence of moisture. At these temperatures, metal seats were necessary, but the company did not want to experiment with the possibility of coating delamination at the very high temperatures and thermal cycling involved. Special seats had to be manufactured with large areas of contact to prevent galling.

Solution: Cameron's TBV line had started in the high alloy, critical service business and had the DBB know-how. Because of the high temperatures experienced by both the isolation valve and the bleed valve, special fugitive emission bonnets were utilized in the design. These bonnets were all equipped with deflector shields to protect the actuation from heat damage. These features helped protect the customer's investment, personnel, and the environment.

Result: By relying on the expertise and experience of Cameron's TBV team, the company was able to successfully run their challenging hot bromide process.

- A seat sealing issue was resolved with a unique seat design where the ball/seat coating were eliminated
- The customer received the special INCONEL material on time – a short time frame most suppliers couldn't meet
- Special Fugitive Emission bonnets were utilized in the design because of the high temperature for both isolation valves and the bleed valve, all with deflector shields to protect the actuation from heat damage – this helped to protect the customer's investment and protect the environment and personnel

How to Order

SERIES 5500 DOUBLE BLOCK-AND-BLEED VALVES

Process Side Valve Size
05 = 1/2"
07 = 3/4"
10 = 1"
15 = 1-1/2"
20 = 2"
30"

Instrument Side Valve Size
05 = 1/2"
07 = 3/4"
10 = 1"
15 = 1-1/2"
20 = 2"
30 = 3"

Port
S = STD Port

Series
55 = 5500

Process Side Valve Connection
150 = ANSI 150# FLG RF
300 = ANSI 300# FLG RF
600 = ANSI 600# FLG RF
900 = ANSI 900# FLG RF
005 = ANSI 1500# FLG RF
BXX = BW+SCH (ex B40)
BWT = BW Ext. Tube Ends
1 = Male Screwed End
2 = Male Socket Weld
3 = Female Screwed Ends
4 = Female Socket Weld

Instrument Side Valve Connection
150 = ANSI 150# FLG RF
300 = ANSI 300# FLG RF
600 = ANSI 600# FLG RF
900 = ANSI 900# FLG RF
005 = ANSI 1500# FLG RF
BXX = BW+SCH (ex B40)
BWT = BW Ext. Tube Ends
1 = Male Screwed End
2 = Male Socket Weld
3 = Female Screwed Ends
4 = Female Socket Weld

Body Material
A2 = Alloy 20
CS = Carbon Steel
DS = Duplex Stainless AL6XN
M4 = MONEL® 400
36 = 316SS
*Other materials available

Valve Ball/Stem Material
A2 = Alloy 20
CS = Carbon Steel
DS = Duplex Stainless AL6XN
M4 = MONEL 400
36 = 316SS
*Other materials available

Seat Material
A = Arlon 1555 PEEK
G = Glass Filled Telfon
K = CTFE
M = Metal
P = UHMWP
T = Virgin Teflon
U = Ultrafil®

Seal Material
H = Graphite
T = Teflon®
W1 = SS Spiral Wound Gasket with TFE
W2 = SS Spiral Wound Gaskets with Graphite

Bolting
0 = None
3 = ASTM A193 B7, A194.2H
4 = ASTM A193 B8M, A194 8M
5 = MONEL K500
B = ASTM A193 B7M, A194 7M
C = ASTM A193B8 CL2, A194 Gr8
D = Alloy 20
F = ASTM A540 B21, A19 Gr2H
G = ASTM A320 L7, A194 Gr4
Q = ASTM A194 Gr8, A194 GrB8
W = All Welded

Block Valve Handle
AH = Actuator with Handle
AI = Actuator Installed
AP = Prepped for Actuation
L = Lever Handle
LL = Lock-Out Lever Handle
LO = Lock-Out Oval Handle
OH = Oval Handle

Handle Orientation
O = Opposing Sides
S = Same Side (Stacked)

Bleed Valve
11 = Series 11
64 = Series 6400
61 = Series 6100
NV = Needle Valve
OS = OS&Y

Bleed Valve Size
03 = 3/8"
05 = 1/2"
07 = 3/4"
10 = 1"

Bleed Valve Connections
THD = Threaded
W = Welded
B = Bolted

Bleed Valve Handle
L = Lever Handle
LL = Lock-Out Lever Handle
LO = Lock-Out Oval Handle
OH = Oval Handle

Modifier
FS = Fire-Safe

Example: 20-07-S-55-150-3-CS-36-U-T-C-OH-O-64-07-W-L-FS

2" process side valve, 3/4" instrument side valve, standard port, series 5500, with process side valve connections ANSI 150# FLG RF, instrument side valve connections female screwed end, carbon steel body material, 316 SS ball/stem material, Ultrafil seat, Teflon seal, ASTM A193B8 CL2 A194 Gr8 bolting, oval handle for block valve on opposing sides, with a series 6400 3/4" bleed valve with welded connections and a lever handle, all fire-safe.

CAMERON

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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.