Bear Dump Valve

Reliable, Solar Ready & Power Fail Safe

A reliable dump valve requires outstanding performance in both the actuator and valve. To achieve this the Bear Dump Valve uses a low power and extensively tested Bear BAQ electric actuator. It is combined with A Hydroplex MiniMax, Mini-A, Mini -Y or CSX valve with its low maintenance twin tungsten carbide disc trim technology. Reliable and zeroemission, using Calscan's Bear Dump Valve will help modernize your separator design.

Electric Motor Features and Specifications

Calscan is continuously testing a 24 VDC electric motor by fully opening and closing every 30 seconds at twice the required max torque of the MiniMax/CSX valve. With over ³/₄ million cycles so far the motor is performing flawlessly, indicating the Bear BAQ Quarter Turn Actuator can take the rigors of driving a dump valve.

- Open or Close time 9 Seconds
- Explosion Proof Class I Div1/Zone 1 Certified
- Power and RTU fail safe operation when used with the Bear FSC and Bear UPS
- Fail on Loss of Signal (Open or Closed)
- Actuator is sealed water tight, so no heater required
- No Disk Springs (Belleville Washers) to wear out
- 4-20mA Modulating or Digital On/Off Control
- Low quiescent current: <15mA On/Off and <40mA Modulating
- 21 to 32 VDC @ <0.7 amp of operating current at 1000psi differential
- For complete electrical information see: BAQ-10Gxx-15S/50 in the "Bear BAQ 24VDC Quarter Turn Actuators" data sheet

Hydroplex Valve Trim Details

All Hydroplex Valves use a unique Twin Disc trim that is specifically designed for precision control of liquids and gases in severe service applications such as sand..

There are two quarter-turn tungsten carbide concentric discs with matching orifices. Each are diamond-polished to \pm 0.00002in to achieve positive shutoff. The bottom disc is stationary in the valve and the top disc rotates to adjust the flow path.



Abrasion Resistant Tungsten Trim rotates to throttle flow



Diamond Polished to a Mirror Finished Class IV Shut Off Seal





The MiniMax is a much higher reliability and cost effective replacement for linear dump valves

Sand Resistant Trim

There are two features, Centerline Flow and the Extended Sealing Surface, of the twin disc trim that gives outstanding reliability. Especially compared with globe valves when the working fluid has entrained sand, which is very common with recently fracked wells.

Centerline Flow

The tungsten carbide discs are abrasion resistant and direct the accelerated flow to the centerline of the piping, keeping entrained sand away from the valve's side wall. This greatly extends the service life of the valve body.

Extended Sealing Surface

Dump Valves, unlike Control Valves are constantly fully opening and closing. As the valve starts to open, the flow is at first partially pinched off and accelerates across the seat/trim at high speeds. At this point the sand entrained in this flow will cut into the trim like a waterjet cutting machine. On a globe valve, shown to the right, it does not take long for the sand to erode the "skin deep" wear margin leading to early failure.

A unique property of the twin disc format, unlike globe valves, is the sealing surface that extends around the disc resulting in a much improved wear margin. In the illustration below it shows how the sand has to wear though a "wall" of tungsten extended sealing surface before it needs to be replaced. As a result the Hydroplex valves can maintain a much more reliable, longer lasting seal than globe valves.

Its impossible to give a exact number of the extended life you will see as it depends on the widely varying conditions of gas/oil wells. In field installations when a Hydroplex valve has replaced a globe valve, you can expect to see a 10 to 50 times life extension over a globe valve in the same well.



The Twin Disk Tungsten Carbide Trim directs any sand in the flow to the center of piping to protect the softer valve body



In traditional Globe Valves any sand entrained in the working fluid will quicky erode though the "skin deep" wear margin especially in dump applications



The Extended Sealing Surface on the Hydroplex Valves is what makes these them so reliable in dump valve applications

Tungsten Carbide Trim Options

	Orifice Size Inches	Cv	64th inch Equivalent Diameter	Hole Geometry
/s size	1/8	0.74	11.3	Round
show	3/16	1.66	16.97	Round
n trim	1/4	2.95	22.6	Round
ator o	3/8	6.63	33.9	Round
Indice	1/2	11.78	45.3	Round
Color	3/4	22.31	62.3	Pie

Note: Generally when throttling under high pressure drops, the valves would be set at: >40% open for liquids and >30% for gas

MiniMax Valve Features and Specifications

- 3000 psi (20600 kPa) MAWP
- The recommended maximum differential pressure in liquid service is 1500 psi (10300 kPa) for 90° angle configurations and 500 psi (3400 kPa) for in-line.
- ANSI FCI 70-2 (ANSI B16.104) Class IV shutoff seal
- Body WCB Carbon Steel
- Seals Peroxide Cured Buna N 90D
- Disc Tungsten Carbide with Nickel Binder
- Internals or Rotators -ANSI Type S17400 PH
- Inline or Angle Body conversion by moving 2" NPT plug
- High Repeatability Rate maintains unparalleled control
- Twin Disc Design separates control and sealing surfaces for longer useful life
- Robust Stem and Seal design integration provides for hundreds of thousands of cycles
- Ease of maintenance with the Internal Cartridge Assembly

MiniMax Valve Cut-Away

- 1 Valve Body: Durable carbon steel body
- 2 Stem Assembly: The smaller shaft diameter reduces operating torque
- **3 Convertible Configuration:** With Hex Plug placement, choose to plumb in-line or 90° right angle to fit your configuration
- 4 Tungsten Carbide Control Discs: The Bear Dump Valve standard trim size is 3/4in but also is available in smaller sizes
- 5 Assembly Cage: Removable cartridge allows for easy assembly and disassembly of all internal valve components



Removable Cartridge holds Trim for fast and easy maintenance



The Bear electric actuator is direct mounted to the MiniMax valve to reduce height H = 11.5 inches



MiniMax Dimensions

Connection Size	Α	В	с
1 inch FNPT	2.66in	3.82in	7.45in
2 inch FNPT	1.84in	3.00in	5.75in

CSX Valve Specifications

- 5000 psi (34400 kPa) MAWP
- Open/Close time 9 Seconds for differential pressures < 3000psi (20700 kPa)
- ANSI FCI 70-2 (ANSI B16.104) Class IV shutoff seal
- CSX Body WCB Carbon Steel
- Seals Peroxide Cured Buna N 90D
- Disc Tungsten Carbide with Nickel Binder
- Internals or Rotators -ANSI Type S17400 PH
- High Repeatability Rate maintains unparalleled control in throttling applications



The Bear electric actuator is direct mounted to the CSX valve to reduce height H = 12 inches

CSX Valve Cut-Away

- 1 Valve Body: Durable carbon steel body
- 2 Stem Assembly
- 3 Thrust Bearing
- 4 Tungsten Carbide Control Discs: All valves come standard with Tungsten carbide Trim available in sizes up to 3/4in
- 5 Optional Fixed Orifice Bean: Removable fixed size choke for multistage throttling
- 6 Optional Wear Sleeve: The wear sleeve is made from a durable Stellite for abrasive or turbulent environments extending valve life
- 7 Cartridge Assembly: Removable cartridge allows for easy assembly and disassembly of all internal valve components
- 8 Maintenance Detection Port: A pressure sensor can be added here for early detection of valve wear
- 9 Wear Disc: Removable cartridge allows for easy assembly and disassembly of all internal valve components
- 10 Methanol Injection Port: Optionally inject methanol right where its needed, where the pressure drops and the hydrates form



Face to Face

CSX End to End Dimensions

Connection Size	Length C	
1 inch FNPT	10.37in	
2 inch FNPT	8.625in	
2 inch 150RF	10.0in	
2 inch 300RF	14.125	
2 inch 600RF	9.75in	
2 inch 1500RF	17.125	

Mini A & Y Valve Features and Specifications

- 3000 psi (20600 kPa) MAWP
- The recommended maximum differential pressure in liquid service is 1500 psi (10300 kPa) for Mini-A configurations and 1000 psi (3400 kPa) for Mini-Y.
- Small valve body to facilitate tight installations
- ANSI FCI 70-2 (ANSI B16.104) Class IV shutoff seal
- Body Standard WCB Carbon Steel
- Seals Peroxide Cured Buna N 90D
- Disc Tungsten Carbide with Nickel Binder
- Internals or Rotators -ANSI Type S17400 PH
- High Repeatability Rate maintains unparalleled control
- Twin Disc Design separates control and sealing surfaces for longer useful life
- Robust Stem and Seal design integration provides for hundreds of thousands of cycles
- Ease of maintenance with the Internal Cartridge Assembly

Mini A & Y Valve Cut-Away

- 1 Valve Body: Durable carbon steel body
- 2 Stem Assembly: The smaller shaft diameter reduces operating torque
- 3 Assembly Cage: Removable cartridge allows for easy assembly and disassembly of all internal valve components
- 4 Tungsten Carbide Control Discs: The Bear Dump Valve standard trim size is 3/4in but also is available in smaller sizes



Connection Size	Α	В	н
1 inch FNPT	2.03in	2.03	10.7



Connection Size	с	н
1 inch FNPT	4.44in	11.6in

Ball Valve Specifications

Bear ¹/₄ Turn Actuators can be attached to a variety of ball valves. Calscan typically recommends and supplies 1 and 2 inch stainless NPT fullport A-T Controls Series 88 ball valves for low differential dump valves situations.

For complete Series 88 ball valve size and configurations information see the "88-3R.pdf" datasheet.



The Bear electric actuator direct mounted to the Series 88 2 inch full port ball valve

Adjusting the Fully Open/Close Position

For detailed instructions on how to adjust the fully Open/Close position of the valve, see the "Bear BAQ 24VDC Quarter Turn Actuators" data sheet

Valve Certification

CRN Number: 0C24298.2 for MiniMax, Mini-Y, Mini-A and CSX

Ordering Information

Not all Port sizes shown below are available on all valves

