

## GENERAL INFORMATION

The EBV valve is a quarter-turn valve with top entry cartridge design which is an extension of the HCV and DOV valves. The Extended Body Valve (EBV) is specifically designed for buried valve application with above ground maintenance without excavation. The cartridge design enables the entire trim of the valve to be removed at one time allowing the extended body to remain in line during periods of maintenance. The body extension is a single section of pipe welded between the top of the valve body and top bonnet. The pipe section is rated and pressure tested to the same parameters as the valve body. The valve can be supplied as a double block and bleed without the need for sub-surface bleed connections. The valve internal components, such as the Hemi/ball, seat/core, seals, and bearings are all contained in the cartridge assembly and the parallel machined body allows for easy installation and removal of the cartridge in the field with minimal time and effort. The valve can be equipped with the following operating options; Lever Operated, Adapted for Actuator, Gear Operated, or Pneumatic/Electric Actuator. Other options are available upon request. Gears, actuators, and levers are referred to as operators in the manual.

## STORAGE

Inspect for any damage that may have occurred during shipment prior to storage and contact your shipper immediately if damages exist. Valves are drained and flange faces are coated with rust inhibitor and flange protectors are installed. Valves and actuation equipment protective covers should remain in place until the valve is ready to be installed in the line. Valves and actuation equipment should be stored inside to protect them from harsh environment including humidity and dust. Valves are shipped in the opened position, with the exception of Fail-Close systems, and should be stored in the as shipped condition. For special long term storage requirements on actuation equipment refer to applicable actuation manuals.

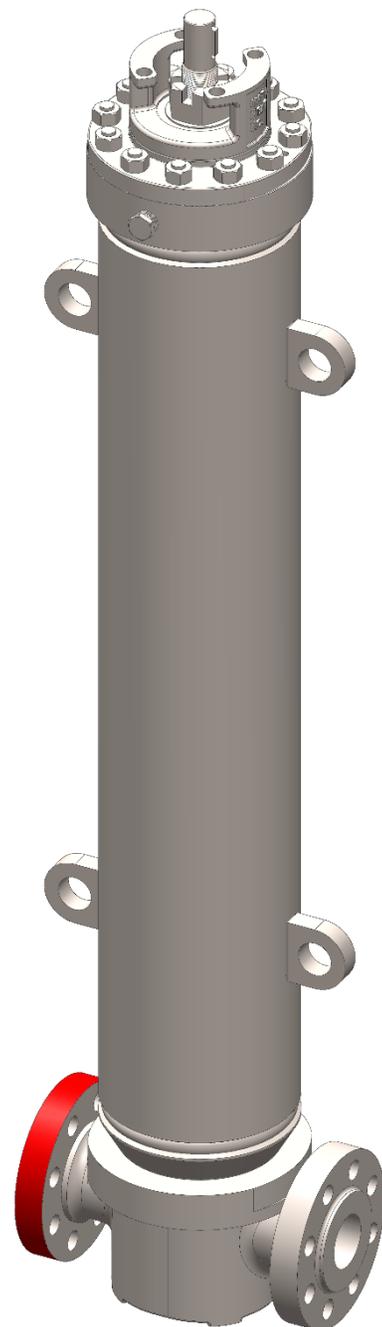
## UNPACKING

Remove any packing material, valve flange protectors, and protective covers from actuation equipment. Inspect the valve bore for foreign objects and, if necessary, clean the valve body. Handling equipment must be provided which is appropriate for lifting the valve and actuator assembly safely into position. Use slings, end flanges or eyebolts in the provided tapped holes on the valve. Do not use the lifting lugs or eyebolts on the actuator to lift the total assembly. Pay attention that slings or braces do not damage the actuator or gear.

## PRE-INSTALLATION SAFETY INFORMATION

The valves shall be installed, operated, and maintained in accordance with these procedures. Always follow standard safety procedure set forth by the law and regulations required by your employer, end-users, and jurisdiction authorities. Any transportation, unpacking, lifting, installation, operation, and maintenance of the system shall be made by expert, trained, and qualified personnel.

**WARNING:** *When lifting a valve with an attached actuator assembly, be aware that the center of gravity may be above the lifting point. Additional support must be provided to prevent the valve and actuator assembly from flipping or rotating. Failure to do so can cause serious injury to personnel and/or damage to the equipment.*



Adapted for Actuator

## INSTALLATION

Identify the valves with the packing list and applicable documents against the name plate for proper identification. Check the total equipment weight and use suitable handling devices to safely install the valves.

Prior to installation, ensure the valve drain and bleed plugs are installed and tightened securely and the valve is in the full open position.

Valves shall be installed in a manner that will not support the weight of the line and line expansion and strain is isolated external to the valve. Install the valve with the preferred inlet, marked by the red flange and marking on the valve body, toward the pump or pressure source. Position the valve in piping to allow clearance and access to the operator. The valve should be installed that the bleed plug is accessible and cartridge removal is possible for in-line service and maintenance.

Flanged valves should be installed using the proper gasket (not supplied) and procedure recommended by National and International Standards/Codes specified for the installation. Butt Weld ends shall be welded in accordance to proper Standard Code welding procedures.

Piping should be thoroughly flushed with the valve in the open position prior to valve operation and the body drained after testing to remove test fluid and debris that may have accumulated in the body during testing.

Install the valve operator according to the manufacturer's guidelines. Refer to pneumatic, hydraulic or electric actuators section for setting or adjusting the open and close stops for the operator.

Operate (dry run) the valve by cycling from open to closed position several times to test and ensure the proper operation of the valve.

## OPERATIONS

Prior to valve operation, make sure that the valve has been installed in the pipeline with the preferred inlet upstream in the normal flow direction. The valve is bi-directional and will seal in either direction. Operating the valve in a preferred or normal flow direction will provide optimum sealing performance and seal life, especially in dirty or contaminated fluids.

The valve operates 90° from the full open to full closed position. The valve is a torque seated valve with the maximum closing torque for the appropriate pressure is applied at the end of the close cycle. Under high differential pressures, the un-seating torque may be as high as the seated torque.

**NOTE:** *Do not over torque in the closed position. Over torque may cause damage to the valve and void the warranty.*

## PNEUMATIC, HYDRAULIC OR ELECTRIC ACTUATORS

In the case when the actuator has been installed prior to receipt or installation, check that air, hydraulic and electrical supply lines are connected per the manufacturer's specifications and instructions. Using the manual override, place the valve in the mid open position. Verify that the actuator mounting bolts are securely tightened. Activate the OPEN button or switch and make sure that the actuator travel counterclockwise towards the open position. If it does not, make the appropriate piping or wiring changes and/or adjustments.

In the case when an actuator has not been previously installed on the valve, mount the actuator and tighten the nuts on the studs securely to the proper torque specification per Table 1. Install the pneumatic or electrical wiring and cable to the actuator according to the manufacturer's instructions. After installation of the operator on to the valve, rotate the position of the Hemi approximately ¼ turn to determine if the Hemi moves to the closed position. If the Hemi does not completely close the port, adjust the actuator stop to reposition the valve's closed position. Turn the actuator to the open position and observe if the Hemi moves completely to the open position. A full port opening should be visible. If the Hemi does not completely move to the open position, adjust the actuator stop to reposition the valve's open position. The Hemi should be in the full open position at zero degrees.

**CAUTION:** *Do not attempt to operate the valve past the full open and closed position. Adjust the operator stops to engage prior to the valve integral stops, as the integral stops in the valve are not intended to be used as the operator stops.*

## MAINTENANCE

The valve does not require periodic lubrication or maintenance to provide continuous trouble-free service. The valve is a torque seated valve and maximum rated torque must be applied in the closed position. If the valve does not seal properly, or if there are difficulties opening or closing the valve, it may be due to foreign material deposits within the cartridge of the valve body. Cleaning may be required in order to remove the debris or foreign objects.

## CARTRIDGE REMOVAL AND INSTALLATION

The following steps should be taken:

1. Isolate the valve section and depressurize the valve body extension ensuring the flow medium does not spill from the bonnet flange mount.
2. Release any pressure which may be trapped in the valve body cavity by opening the bonnet's bleed plug and venting to the atmosphere.
3. Operate the valve to the open position.
4. Remove the valve operator.
  - If an actuator is installed on the valve, reverse the steps described in the pneumatic, hydraulic or electric actuators section for the removal of the actuator.
  - If a manual lever is installed, back off on the set screw and remove the lever or handle.
5. Loosen and remove bonnet bolting.
  - If the valve is equipped with a bonnet assembly and a separate stem extension assembly, the bonnet assembly must be removed prior to removal of the stem extension assembly. If maintenance to be performed on the stem or bonnet seal only, the stem extension removal is not necessary. If the maintenance to be performed on the stem extension only, the bonnet assembly can be reinstalled without additional maintenance.
  - If the valve is equipped with integral bonnet and stem extension cartridge, remove the cartridge from the valve body, Figure 1.
 

**NOTE:** *If the cartridge/bonnet assembly is difficult to remove, attach a lifting device to the two eye bolts or jack screws located on top of the bonnet. The assembly must be pulled straight out from the body to ensure easy removal.*
6. Inspect the cartridge for signs of damage to any internal parts.
  - Clean the cartridge by flushing all the inside surfaces of the cartridge with clean water. Flush several times with the Hemi in the open and closed positions to remove any deposited debris. Make sure that no foreign objects is between the Hemi and the cartridge's side plates.
  - If damaged, replace with a new cartridge. Remove the protective covering from the new cartridge assembly. The replacement cartridge unit has been attached to the bonnet for easy installation into the body.
7. Prior to installing the new cartridge, clean the inside of the valve body and apply grease to the seat/core surfaces which will come in contact with the machined areas of the body.
8. Remove and replace the old bonnet seal from the upper flange of the valve. Replace with a new bonnet seal by pressing the seal into the groove on valve body's upper flange. The replacement bonnet seal is shipped loose with the new cartridge.
9. Install the cartridge/bonnet assembly.
  - If the valve is equipped with a bonnet assembly and a separate stem extension assembly, orient the stem extension by matching the color mark with the top connector and lower the assembly until it sits firmly in the valve body. Install the bonnet assembly on the valve with the stem slot aligned with the stem extension.
  - If the valve is equipped with integral bonnet and stem extension cartridge, install the assembly by orienting the bonnet with alignment pin or marking in the top flange and gently lower the cartridge into the valve body.
10. Replace the nuts on each stud and torque securely to the proper torque specification in a cross pattern method in 25% increment per Table 1.
11. Reinstall the valve operator.
  - Reinstall the actuator according to the steps described in the pneumatic, hydraulic or electric actuators section.
  - Reinstall the manual lever on the valve by tightening the set screw to the valve stem.
12. Open and close the valve several times to assure proper sealing and operation.

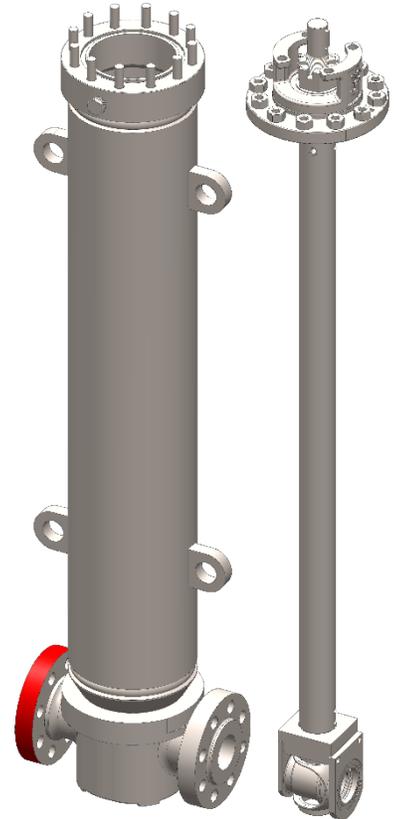


Figure 1: Cartridge Removal/Installation

Size (inches)	1/2	5/8	3/4	7/8	1	1-1/8	1-1/4	1-3/8	1-1/2
Torque (lbf.ft)	68	136	242	390	584	856	1204	1632	2154
Torque (N.m)	92	184	328	528	792	1160	1632	2212	2920

Table 1: Bolt Torques

BILL OF MATERIAL	
ITEM NO.	DESCRIPTION
1	EXTENDED BODY
2	BONNET SEAL
3	STUD
4	NUT
5	SCREW
(1) 6	CORE RETAINER
(2) 7	CORE ASSEMBLY
8	HEM/BALL
9	SEAT ASSEMBLY
10	SEAT RETAINER
11	STEM
12	KEY SQUARE
13	BONNET
14	STEM PACKING
15	FOLLOWER
16	STEM BEARING
17	STUD
18	GLAND PLATE
19	BELLEVILLE WASHER
20	NUT
(3) A	CARTRIDGE ASSEMBLY
(4) B	BONNET ASSEMBLY
(4) C	STEM EXTENSION ASSEMBLY

- (1) For DOV valves, item 6 is replaced with a duplicate item 10.
- (2) For DOV valves, item 7 is replaced with a duplicate item 9.
- (3) Valves with integral Stem Extension.
- (4) Valves with separate Stem Extension.

**NOTE:** Valves are either equipped with Cartridge Assembly (A) or Bonnet Assembly (B) and Stem Extension Assembly (C).

