

AMERICAN CONE VALVE SPECIFICATION

General

Cone Valves shall be manufactured by American Cone Valve, Inc. All cone valve applications will be reviewed by factory qualified personnel to assure proper sizing of the valve, mechanism, actuator and local controls. The manufacturer will be regularly engaged in the design and production of equipment and installations of this nature having no less than 10 years of experience.

Valve Components

Body - The valve body shall be manufactured of Ductile Iron ASTM A536 Gr. 65-45-12. The waterway will be full ported with ANSI B161 class 125# or 250# bolting flanges. The flange for the cover connection will include an o-ring seal groove and a close tolerance registered machined joint to maintain the valve centerline axis. The body will have raised monel seating surfaces for mating with the seats on the cone. The bottom of the valve body will contain an integrally cast trunnion that will house a Bronze ASTM B584 bearing to support the cone's rotational axis. The bearing shall be both pressed in place and mechanically retained.

Cone - The cone shall be manufactured of Ductile Iron ASTM A536, Gr. 65-45-12 with a fully ported open waterway. The cone will have two raised monel seating surfaces for mating with the body seats in the closed position or four seats if seating in the open position is required. The top and bottom of the cone shall have integrally cast trunnions containing Bronze B584 bearings that will mate with the top cover and body bearings. The cone bearings will be made of dissimilar bronze to prevent galling and to provide self lubrication. The bearings shall be both pressed in place and mechanically retained.

Top Cover - The cover shall be manufactured of Ductile Iron ASTM A536, Gr. 65-45-12. The cover/body connection will have an o-ring water tight seal. The cover and body will also include a close tolerance spigot connection to maintain the valve centerline axis. The cover will have an integrally cast trunnion that contains a Bronze B584 bearing. The bearing shall be both pressed in place and mechanically retained. The stuffing box will include adjustable graphite packing and a non-corrosive packing gland such as bronze or stainless steel.

Operating Mechanism - The lift/turn operating mechanism shall be fully enclosed with a steel housing and cover. The valve shaft will be stainless steel type 17-4 with minimum 125,000 psi yield strength. The mechanism will consist of steel linkage, steel lifting and rotating levers, stainless steel guides, bronze crosshead and bronze lifting nut. The operating mechanism will connect to the valve cover utilizing a steel adapter. The adapter will allow easy access for packing adjustment or replacement. The adapter and mechanism will be sized by the factory to withstand and transmit the maximum operating forces required to operate the valve. The mechanism assembly will be aligned and pinned to maintain valve centerline axis. All lubrication points will be easily accessed externally, without disassembly of the housing. A mechanical pointer will attach to the valve shaft to indicate the valve position and to operate the limit switches.

Actuator

The actuator shall be an AWWA C540 water, air, or oil hydraulic cylinders, electric motor or manual gear as specified. These shall be sized in conjunction with the operating mechanism and the application parameters. Contact the factory for specific actuator construction details.

Hydraulic Controls (if cylinder actuated) - Each cone valve will contain hydraulic controls that will operate the cone valve in accordance with the control schematic outlined in the project plans. The controls shall be piped to the hydraulic cylinder by the valve manufacturer or to a hydraulic control panel if specified. Control system components shall include, but not limited to, solenoid valves, flow control valves for timing, strainers, and manual isolation valves. The hydraulic controls will be sized to accommodate normal opening /closing times and fast closure in the event of power failure.

Four Way Solenoid Valve - The 4-way solenoid valve for normal operation of the cone valve shall be of forged brass construction. The solenoid valve will be equipped with a manual override and suitable for operation using 120 volt, single phase service unless specified otherwise. Solenoid valve shall be ASCO model 8344.

Two Way Solenoid Valve - The 2-way solenoid valve will be required for the fast closure of the cone valve in the event of a loss of electric. The valve shall be of forged brass construction. Each valve shall be suitable for operation using 120 volt, single phase service. Solenoid valve shall be ASCO model 8210.

Flow Control Valve - Each cone valve shall be provided with (2) flow control valves that will be adjustable to control the opening and closing time of the cone valve. Flow control valves shall be of bronze construction and shall be manufactured by Parker Corp. or approved equal.

Emergency Manual Speed Control Valve - Adjustable needle valves shall be bronze constructed with threaded ends. Needle valves shall be manufactured by Parker Corp. or approved equal.

Limit Switches - Each cone valve will require three industrial type limit switches to monitor and control the valve operation. Limit switches will be mounted to the top cover of the valve operating mechanism and will be engaged / disengaged by the mechanical pointer. Two (O/C) limit switches shall be positioned to indicate when the cone valve is completely open and completely closed. O/C Limit switches shall be heavy duty industrial type NEMA 4, lever arm actuated w/ spring return. They shall be of the maintained contact type and rated for 120 volt continuous power. Limit switches shall be manufactured by Micro Switch (a division of Honeywell) or engineered approved equal. The third limit Switch (pump shutdown switch) shall be positioned to trip when the cone valve is 95% closed. This switch will be a non-maintained contact and will signal the pump shut down. The PSD switch will be manufactured by Micro Switch or approved equal.

Pressure Switch (Optional) - The pressure switch shall be mounted on the piping between the pump and the new cone valves. The pressure switch shall sense pump discharge pressure and make contact to energize the 4-way solenoid valve on the cone valve hydraulic control system. Pressure switches shall be fully adjustable, Type G industrial, diaphragm type with Nema 4 enclosure and ¼" minimum NPT pressure connection. The switch shall have an adjustable range up to 250 psi. Pressure switch shall be Square D, Class 9012, Model GAW-26 or engineer approved equal.

Factory Testing

HYDROSTATIC TEST - Each cone valve shall be hydrostatically tested for 10 minutes at 1.5X the operating pressure and shall show no signs of distress or weeping through the castings.

LEAK TEST - Each cone valve shall be leak tested for 5 minutes at the actual working pressure. Leakage past the closed seats shall not exceed .4 oz/min. for each nominal inch of waterway.

CYLINDER TEST - Each hydraulic cylinder shall be leak tested from both port openings for five minutes at the normal supply pressure. Each cylinder shall also receive a hydrostatic test at 2X the maximum cylinder operating pressure. There shall be no leakage permitted for either test. The cylinder will also be cycled three times prior to installing onto the mechanism.

VALVE OPERATIONAL TEST - Each cone valve, once completely assembled, will be operated from complete close to open and open to close a minimum of 3 times to demonstrate smooth operation.

Factory Coating

Each cone valve shall have all interior surfaces in contact with water, painted with 2 coats of potable epoxy. The coating shall be NSF 61 approved, unless specified otherwise. Each cone valve shall have all exterior surfaces coated with a universal shop primer. Primer will be compatible to final field painting.