CONE VALVES

PRATT®

Section 151xx- Cone Valves

Part 1 General

1.1 Description

This section includes all materials, installations and testing of hydraulically operated metal seated cone valves including accessories, linings and coatings as shown in the Drawings and specified herein, in accordance with the Contract Documents. Size ranges are from 8" through 48"

1.2 Related Work Specified Elsewhere

The work in the following Sections also apply to the Work in this Section. Other Sections may also apply.

A. Standard Provision
B. Section 01300 – Submittals
C. Section 09900 – Painting and Coating
D. Section 15044 – Pressure Testing of Pipe
E. Section 15050 – General Piping Requirements
F. Section 15100 – Valves

1.3 Submittals

A. The following shop drawings shall be submitted in accordance with Section 01300:

1. Shop drawings and catalog cuts for the valve, which indicate physical dimensions, performance, materials of construction, weight, and all other required items of information

2. Manufacturer's shop drawings, with complete dimensions, showing the intended orientation of the valve and its operator and clearly identifying the location at which the valve is to be installed

3. Manufacturer's shop drawings showing a complete cut-a-way view of the cone valve and identifying all components

4. Wiring and electrical connection diagrams for all electrical items. (if required)

5. Hydraulic and leakage test reports

PART 2 Products

2.1 General

A. The cone valve shall consist essentially of a body, plug, shaft, cover, operating mechanism, actuator, position indicator, and all required appurtenances to form a completely assembled unit. The operation of the cone valve shall take place by using an axial motion to unseat the plug and lift it above the seat surface. The plug will rotate 90 degrees from the closed to the open position and then re-seat.

B. The cone valve body shall be made of ductile iron and shall conform to ASTM A-536 GR 65-45-12. Body wall shall be per AWWA C-507 requirements for 300# ductile iron wall thickness. Body shall be a single piece. Multiple sections bolted together shall not be acceptable. Class shall be per design pressure. It shall have a full, unobstructed waterway equal in diameter to the size of the valve required. Valve shall be flanged on the upstream and downstream side of the valve. Flanges shall conform to the requirements of ANSI B-16.1. Class shall be 150# or 300# based on design pressure. The valve body shall have monel seat rings electrically fused to the body waterway on both the upstream and downstream side which shall engage the seat rings of the plug when the plug is seated. Body shall incorporate exterior ribs to minimize body expansion due to internal pressure.

C. The plug shall be made of ductile iron and shall conform to ASTM A-536 GR 65-45-12. The plug shall be conical in shape. It shall have a clear, unobstructed waterway opening equal to the valve nominal diameter. The plug shall have our anti-cavitation monel seat rings which shall engage the monel seat rings on the body when seated in either the fully open or fully closed position. Angle of plug seats shall be the same as on body and shall ensure proper clearance between plug and body as plug rotates. Seat angle shall be at least 4.57 degrees. The plug shall rotate on bronze bearings secured on the upper and lower trunnions. Bearings shall be designed such that the trunnions do not experience bottom or topside loading which may inhibit its ability to lift or fully seat. The operating shaft shall be securely attached to the plug to transmit the lifting force and operating torque.

D. The cover plate shall be made of ductile iron and shall conform to ASTM A-536 GR 65-45-12. The cover plate shall be bolted to the valve body and shall provide support for the operating mechanism.

E. The operating mechanism shall be contained with the ASTM A-536 GR 65-45-12 ductile iron or fabricated steel ASTM A-36 housing and shall be bolted to the cover plate. The housing shall be designed to support the operating mechanism and actuator, including the thrust bearing and lifting nut for valve rotation. Mechanism shall be provided with grease fittings as required. An indicator shall be attached to the outer end of the rotation shaft for indicating plug opening with respect to the opening of the body. Mechanical actuator shall consist of a lifting lever to perform seating and unseating functions through a threaded bronze lift nut and a rotator lever. A steel lifting lever linkage shall be connected to the crosshead. The crosshead shall use guide rods and rollers of stainless steel to transfer the rotary motion.

F. The actuator shall be mounted on a carbon steel ASTM A-36 adapter plate. The adapter plate shall be bolt connected to the operator housing.

G. All fasteners connecting the head cover to the body flange shall be high strength steel ASTM A-193 Grade B8 with ASTM A-194 Grade 2H nuts. All wetted bolts and nuts shall be stainless steel.

H. Cone valve shall be suitable, in all respects, for the intended service.

I. Cone valve shall be Henry Pratt or pre-approved equal.

2.2 Design Criteria

A. Size (in): (to be specified)

B. Design Pressure (psi): 150psi or 300psi (to be specified)

C. Flow, maximum (cfs): (to be specified)

2.3 Lining and Coating

A. The manufacturer shall line all internal ductile iron surfaces, except finished or bearing surfaces, with Ameron 370 to a thickness of 12 mils.

B. All exterior steel or ductile iron surfaces of each valve, except finished or bearing surfaces, shall be shop coating with one or more coats of Ameron 370.

2.4 Testing

A. Hydrostatic Test – With the plug in the partially open position and blind flanges on the upstream and downstream waterways, the valve shall be hydrostatically tested using two times the required working pressure for 30 minutes. The casting shall show no sign of leakage or distress.

B. Leakage Test – With the plug in the closed position and the working pressure applied to one side at a time, the leakage rate shall not exceed 0.4 ounces per minute per inch of diameter.

2.5 Operator

A. The cone valve shall provide the electric motor operator, hydraulic cylinder, or manual handwheel and all associated appurtenances, as shown on the drawings and as specified herein.

B. If using an electric motor operator, the motor shall conform to AWWA C-540 unless otherwise specified herein. Motor operators shall include electric motor, reductive gearing, gear case, torque and limit switches, space heaters, shop wiring, push button control, indicator lights, starter package and all other appurtenances as required for a complete operator unit. A clutch mechanism shall be provided to allow manual operation of the valve via a handwheel. The

clutch mechanism shall be configured to manual disengage and then automatically reengage the motor operator from the valve.

C. If using a hydraulic cylinder, the valve manufacturer shall be responsible for providing one complete hydraulic system to include hydraulic cylinder, oil reservoir, pump, accumulator, control system, all required piping, valves, and starters. The valve manufacturer shall design, manufacture, and furnish each oil hydraulic system. The hydraulic actuator shall be sized to open and close the valve against the hydraulic conditions listed. The control system shall be designed for an operating time of no less than 2 minutes. The accumulator shall be sized for a minimum of 3 stroke lengths.

PART 3 Execution

3.1 Installation

A. All cone valves shall be installed with a means of removing the complete valve assembly without dismantling the valve or operator. The installation shall be in accordance with Section 15100 – Valves.

END OF SECTION