FIXED CONE VALVE with HOOD

PRATT®

Section 151xx- Fixed Cone Valve with Hood

Part 1 General

1.1 Description

This section includes all materials, installations and testing of fixed cone valves including accessories, linings and coatings -s shown in the Drawings and specified herein, in accordance with the Contract Documents.

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 shall include drawings of the fixed cone valve and actuator assembly, which shall indicate all dimensions, materials of construction including all applicable ASTM standard specifications, all necessary detail views, and total weight for each complete valve assembly.

2. Certified test data from the manufacturer, demonstrating that valve design can meet flow requirements indicated.

3. Flow and discharge data curves.

4. O&M manuals including storage, installation, start-up, spare parts, and maintenance instructions.

5. Reference list of 10 similar design installations.

PART 2 Products

2.1 General

A. Each fixed cone valve assembly shall consist essentially of the following; a valve body, a fixed cone with self-adjusting seat, a moving gate, and an actuator or hydraulic cylinder. The body shall have an inlet flange for mounting the valve into the pipe system. The flange shall conform to AWWA C-207 and the class shall be determined by design pressure. The body shall have a mounting flange used as a support leg for the valve and as a mounting bracket for valve actuator or cylinder. The body shall have nitronic 60 wear strips to prevent galling between the body and gate. The body shall house a rubber seal to prevent upstream leakage between the body and the gate. The valve shall be designed such that the seal shall be replaceable without removal or disassembly of the valve. All pressure retaining components shall be made from carbon steel ASTM A-516 GR 70 while structural components shall be made from carbon steel ASTM A-36.

B. The fixed cone shall be inline and concentric with valve body. The cone shall be attached to the body by ribs welded to the inside of valve body an upstream side of cone. The ribs shall be contoured to provide vibration free operation and prevent pressure fluctuations. Cone and ribs shall be made from carbon steel ASTM A-516 GR 70. Tight shutoff shall be achieved by a floating seat held in place by Silastic J. The floating seat shall be designed to provide self-alignment. Seat shall be replaceable without removing valve from the pipeline. Seats welded to or bolted to the cone shall not be acceptable. Seat shall be made from nitronic 60.

C. The gate shall be used to control flow rate and pressure. The gate, in its fully closed position, shall provide shutoff with its downstream edge making contact with the metal seat ring on the cone. In the fully open position the gate shall be completely retracted in the upstream direction while the cone diverts the water flow into a radially discharging conical expanding spray. Stroke length shall be determined by the valve manufacturer. The gate shall be made from ASTM A-351 GR CF8, if centrifugally cast, or ASTM A-240 Type 304, if rolled plate. Gate can be actuated by means of twin lever arms or twin screws. For the lever arm design, operation can be achieved by means of electric motor or hydraulic cylinder. For twin screw design, only electric motor operation is acceptable.

D. The hood shall be used to contain the exit flow. The hood shall be bolted to the cone. The hood shall be removable without removal of valve from line. Hoods welded to the cone or attached to gate shall not be acceptable. Where possible the hood shall be designed with a 2:1 ratio (hood diameter to line diameter). Hood shall be made from ASTM A-516 GR 70.

2.2 Operators

A. The fixed cone valve manufacturer 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. Motor shall be designed for an operating time of approximately 5 minutes (300 sec).

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 accumulator shall be sized for a minimum of 3 stroke lengths. The control system shall be designed for an operating time of approximately 5 minutes (300 sec).

2.3 Design Criteria

A. Line size (in):

B. Flow rate (gpm):

C. Maximum upstream pressure (psi):

D. Minimum upstream pressure (psi):

E. Flange pressure class (AWWA): (*B-86psi, D-150psi, E-275psi*)

F. Operating time (sec):

G. Fail position: (*fail closed, fail open, fail last position*)

H. Service: (*raw water, potable water*)

2.4 Valve Testing

A. Hydrostatic Test – Valves shall be hydrostatically tested for 30 minutes at twice the maximum operating pressure. No distortion or other defects of design or construction shall be evident during the test.

B. Functional Test – Fully assembled valve complete with operator shall be cycled a minimum of 3 times from open to closed to verify proper operation.

2.5 Lining and Coating

A. All internal and external carbon steel surfaces of each valve, except bearing surfaces and bolt/screw holes, shall be shop coating with one or more coats of Ameron 370.

2.6 Manufacture

A. Model 117 fixed cone valves shall be manufactured by Henry Pratt Co. or preapproved equal.

PART 3 Execution

3.1 Installation

A. Valve installation shall be in strict accordance with the manufacturer's printed recommendations, and the contract documents.

3.2 Testing

A. After completion of installation, each control valve shall be completely field tested by the contractor with the assistance of the valve manufacturer's authorized representative over the indicated flow range. For each test condition, the flow shall be recorded along with the inlet head conditions. Full stroke time from open to close shall be recorded.

END OF SECTION