SECTION 15100
PUMP CHECK VALVES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Pump Check Valves, 4-36" (100-900mm), of rectangular port construction with resilient faced cylindrical plugs eccentrically offset from the seat, for the purpose of controlling valve opening and closing speeds to prevent reverse flow and pump back spin.

1.02 REFERENCES

A. ASTM A126 Class B "Gray Iron Castings for Valves, Flanges and Pipe Fittings"
B. ASME B16.1 "Pipe Flanges and Flanged Fittings"
C. AWWA C517 “Resilient-Seated Cast-Iron Eccentric Plug Valves”
D. AWWA C111 "Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings"
E. NSF/ANSI 61 “Drinking Water System Components - Health Effects”
F. NSF/ANSI 372 “Drinking Water System Components - Lead Content”

1.03 SUBMITTALS

A. Submit detailed product data and descriptive literature to include dimensions and materials of construction.
B. Provide shop drawings to show installation arrangement of major component assemblies.

1.04 QUALITY ASSURANCE

A. Supplier shall have been manufacturing pump check valves for a period of at least ten years. At the engineer's request, supplier shall provide a list of installations involving equipment of similar size and application.
B. Valves and Actuators shall be warranted by the manufacturer for defects in materials and workmanship for a period of two years (24 months) from date of shipment.
C. Each valve and actuator shall be assembled, adjusted and tested as a unit by the valve manufacturer.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. DeZURIK
    1. DeZURIK Pump Check Valve

2.02 PUMP CHECK VALVES

A. Design:
1. Pump Check Valves shall be eccentric plug valves unless otherwise specified.
2. General:
   a. Pressure ratings shall be 175 psi (1210 kPa) on valve sizes through 12" (300mm) and 150 psi (1035 kPa) for 14" (350mm) and larger. Every valve shall be given a certified hydrostatic shell test and seat test, with test reports being available upon request.
   b. End connections shall meet or exceed the latest revisions of AWWA C517. End Connections shall be flanged drilled per ASME B16.1 or mechanical joint per AWWA C111.
   c. When specified, valves shall be NSF/ANSI 372 certified lead-free and NSF/ANSI 61 certified for drinking water.
3. Materials:
   a. Plugs shall be solid one piece, Cast Iron ASTM A126 Class B or Ductile Iron ASTM 536 Grade 65-45-12. The plug shall have a cylindrical seating surface eccentrically offset from the center of the shaft. Plug shall not contact the seat until at least 90% closed. Resilient plug facing shall be Chloroprene (CR). Spherical shaped plugs are not acceptable.
   b. Bodies and covers shall be Cast Iron ASTM A126 Class B. Ports shall be rectangular. Round ports are not acceptable.
   c. Bearings shall be sleeve type and made of sintered, oil impregnated permanently lubricated type 316 Stainless Steel for sizes 4-18” (100-450mm) and ASTM A743 Grade CF8M for sizes 20-36” (500-800mm).
   d. Seats shall be 1/8” thick welded overlay of not less than 95% pure nickel. Seat shall be at least 1/2” wide, 1/8” thick through entire width and raised. The raised surface shall be completely covered with nickel to ensure that the resilient plug face contacts only the nickel seat.
   e. Adjustable packing shall be Acrylonitrile-Butadiene (NBR) multiple V-ring type, with a packing gland follower. Packing gland shall permit inspection, adjustment or complete replacement of packing without disturbing any part of the valve or actuator assembly, except the gland follower. Non-adjustable packing or packing requiring actuator removal to replace the packing, is not acceptable.
4. Specifications for Cylinder Actuators:
   a. Actuators shall be of the rack and gear type and shall be enclosed in a cast iron housing with seals provided on all shafts to prevent entry of dirt and water into the actuator.
   b. Actuator shaft and gear sector shall be supported on permanently lubricated bronze bearings.
   c. Cylinder tubes shall be fiberglass with molybdenum disulfide lining. Interior shall be glass smooth. Piston, cylinder heads and caps shall be cast iron.
   d. All exposed nuts, bolts and washers shall be zinc plated or stainless steel.
   e. Actuators shall clearly indicate valve position and include an adjustable stop to set closing torque and make adjustments for pressure differential or flow direction changes.

5. Specifications for Pump Check Controls shall include:
    a. Pneumatic – 4-Way 120 VAC solenoid valve used in automatic open/close operation and shall be of sufficient size to allow fast operation of pump check valve.
    b. Water-Hydraulic – 4-Way 120 VAC solenoid valve used in automatic open/close operation for piloting main 4-Way switch valve. Switch valves shall be of sufficient size to allow fast operation of pump check valve.
    c. Adjustable open and close speed controls, capable of matching the pump check valve operation speeds to the requirements of the pump system.
    d. 4 SPDT limit switches for open, closed, and intermediate position indication. The intermediate position can be adjusted and can interface with the pump motor controls, allowing coordination between the pump shut down sequence and valve closure.
    e. Manual/Auto selector to allow choosing between local manual operation and automatic operation through the 4-Way solenoid valve.
    f. If required, optional 2-Way 120VAC solenoid, fail open, for rapid closure in the event of pumping system failure.

PART 3 - EXECUTION

3.01 INSTALLATION

A. In applications of liquids with suspended solids or dirty gases:
    1. For valves installed in a vertical pipeline, or where the possibility of overhead drain-back exists, install the valve with the seat at the top to prevent drain-back solids from settling into the valve body.
    2. For valves installed in a horizontal pipeline, install the valve so the plug rotates up when opened. Install the valve with the higher pressure against the seat end of the valve.

B. In applications of clean liquids and gases for eccentric plug valves installed in a horizontal or vertical pipeline, it is recommended that the valve be installed with the higher pressure against the end opposite the seat.