

SECTION 400551 - PLANT VALVES

PART 1 – GENERAL

1.01 DESCRIPTION

- A. Work Included: This section covers plant (Interior) valves and miscellaneous appurtenances. Furnish and install valves and miscellaneous appurtenances complete with all accessories, bolts and gaskets which are shown on the manufacturer's drawings, are specified herein, or are otherwise required for proper installation and functioning of the system.
- B. Related Work:
 - 1. Section 400520 – Pipe and Fittings

1.02 SUBMITTALS

- A. Submit complete drawings and product data covering valves and appurtenances in accordance with Section 013300.
- B. Submit manufacturer's certification that products meet the reference standards in accordance with Section 013300.

1.03 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Do not damage materials during delivery or storage.
- B. Store valves off the ground and away from materials that could contaminate potable water systems.
- C. Keep joints and internal parts clean.

1.04 CERTIFICATION

- A. All plant valves shall be NSF/ANSI 61 and NSF/ANSI 372 certified.

1.05 BUY AMERICAN REQUIREMENTS

- A. Provide certificates to show that all products meet the following requirements.
 - 1. American Iron and Steel (AIS)
 - 2. Build America, Buy America Act
- B. See Supplementary Conditions for details.

PART 2 – PRODUCTS

2.01 GATE VALVES (3" SIZE AND LARGER)

- A. Resilient seat gate valve manufactured in accordance with AWWA C-509.
- B. Stem Seal-O-Ring.
- C. Joints as specified.

- D. Hand-wheel operator unless otherwise specified in the drawings.

2.02 GATE VALVES (SMALLER THAN 3")

- A. Bronze Valves 85-5-5-5: ASTM B62.
- B. Joints shall have NPT threaded connections.
- C. Handwheel operator unless otherwise specified in the drawings.

2.03 BUTTERFLY VALVES

- A. AWWA Style Valves. Valves shall comply to the latest revision of AWWA C504, Short Body Pattern, unless otherwise noted.
- B. Hand-lever operator unless otherwise specified in the drawings.
- C. Manufacturers:
 - 1. DeZurik
 - 2. Nibco
 - 3. Bray Valves
 - 4. Approved Equal.

2.04 BALL VALVES

- A. Ball valves shall be lead-free bronze, full port style valve with hand-lever operator unless otherwise specified in the drawings.
- B. Manufacturers:
 - 1. Nibco
 - 2. Apollo
 - 3. Approved Equal.

2.05 CHECK VALVES

- A. AWWA Style Valves. Valves shall comply to the latest revision of AWWA C508.
- B. Manufacturers:
 - 1. G.A. Industries, Inc., 250 D with renewable bronze seat.
 - 2. American Darling, 52 SC.
 - 3. Mueller, "Detector Gravity."
 - 4. Cla-Val
 - 5. Val-matic
- C. 150 psi working pressure related. Valves shall be swing check valves unless otherwise noted.

2.06 AIR RELEASE AND COMBO AIR RELEASE-VACUUM VALVES

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Clow
 - 2. Apco
 - 3. Crispin
 - 4. Flomatic
- B. Valves shall be air release, or a combination air release and vacuum valve as specified on the drawings.
- C. Valves shall be equipped with large orifices for the re-entry and escape of air during draining and filling. Valves shall also be equipped with a small orifice to allow the escape of accumulated air during normal operation.
- D. Valves shall have cast or ductile iron bodies.
- E. Floats shall be stainless steel or other non-corrodible material.
- F. Valves shall have a minimum operating pressure of 150 psi.
- G. Valve size shall be as shown on the drawings.

2.07 PRESSURE REDUCING VALVES (PRV) (2" SIZE AND LARGER)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Cla-Val.
 - 2. Zurn.
 - 3. Watts
 - 4. Approved Equal
- B. PRV shall have 150 lb flanged ends in accordance with ANSI B16.42.

2.08 PRESSURE SUSTAINING/REDUCING VALVES (PSV) (2" SIZE AND LARGER)

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Cla-Val.
 - 2. Zurn.
 - 3. Watts
 - 4. Approved Equal
- B. PRV shall have 150 lb flanged ends in accordance with ANSI B16.42.

2.09 ACTUATED VALVES

- A. Flanged ends: 150 lb flanged ends in accordance with ANSI B16.42
- B. Fully factory assembled. Size to operate with sufficient reserve power to provide smooth modulating action or two-position action under every condition.
- C. Motor: The motor shall be an integral part of the actuator, designed specifically for valve actuator applications. The motor shall be a permanent magnet 24 V dc type with power derived from a 3-phase, 1-phase, or DC supply. The motor shall be a low inertia, high torque design and class H insulated. Gear train shall be totally enclosed in an oil-filled gearcase for operation at any angle. Motors for isolation duty shall be rated for 60 starts/hour. Motors for modulating duty shall be rated for 1,800 starts per hour.
- D. Actuator: Direct-coupled type non-hydraulic designed for minimum 100,000 full-stroke cycles at rated torque. Furnish actuator with rating of not less than twice thrust needed for actual valve.
 - 1. Coupling: To match valve connection.
 - 2. Overload Protection: Electronic overload or digital rotation-sensing circuitry.
 - 3. Speed Adjustment: Actuator must include a speed adjustment setting to change the motor operating speed.
 - 4. Power Requirements: 208 V ac, 3 phase.
 - 5. Control Power Requirements: 24 V dc.
 - 6. Inputs/Outputs: One (1) analog input (4-20 mA) for position control; One (1) analog output (4-20 mA) for position feedback.
 - 7. Ambient Temperature: Minus 22 to 140 deg F.
 - 8. Size actuator for torque required for valve to close off at maximum differential pressure, regardless of water loop system pressures.
 - 9. Fail-Safe Operation: Actuators with designated fail position shall be supplied with integral shutdown battery with sealed battery pack. Battery pack shall be housed inside actuator body and shall facilitate actuation of valve to fail close position on loss of power. Battery capacity shall be suitable for a minimum of two (2) full valve stroke operations.
 - 10. Handwheel: Provide handwheel for emergency operation, engaged when the motor is declutched by a lever or similar means. The drive shall be restored to electrical operation automatically by starting the motor. The handwheel or selection lever must not move on restoration of motor drive.
 - 11. Local Controls: The actuator must incorporate integral local controls for Open/Close operation and include a Local/Stop/Remote mode selector switch.
- E. Acceptable actuator manufacturers include: Rotork or approved equal.

PART 3 – EXECUTION

3.01 INSPECTION

- A. Examine the valves and appurtenances for cracks, flaws or other defects. Remove all defective valves and appurtenances from the site. Repair or replace all damaged coatings.

- B. If material is found to be defective by the OWNERS or ENGINEER, the CONTRACTOR shall promptly remove the defective material, whether installed or not, and immediately replace it with acceptable material.

3.02 INSTALLATION

- A. Manufacturer's Instructions: Follow the published instructions of the manufacturers of all items covered in this section.
- B. Install with valve operator plumb and vertical. Provide anchor ties were determined by ENGINEER or shown by plans.
- C. Install all gaskets per manufacturer's recommendations and referenced standards. Torque bolts in accordance with standards and manufacturer's recommendations.

END OF SECTION

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