

**SECTION 21 05 23**  
**GENERAL-DUTY VALVES FOR WATER-BASED FIRE-SUPPRESSION PIPING**

**PART 1 - GENERAL**

**1.1 STIPULATIONS**

- A. The specifications sections "General Conditions to the Construction Contract", "Special Conditions" and "Division 01 - General Requirements" form a part of this Section by this reference thereto, and shall have the same force and effect as if printed herewith in full.

**1.2 SUMMARY**

- A. Section Includes:
1. Two-piece ball valves with indicators.
  2. Bronze butterfly valves with indicators.
  3. Iron butterfly valves with indicators.
  4. Check valves.
  5. Bronze OS&Y gate valves.
  6. Iron OS&Y gate valves.
  7. NRS gate valves.
  8. Trim and drain valves.

**1.3 DEFINITIONS**

- A. NRS: Non-rising stem.
- B. OS&Y: Outside screw and yoke.
- C. SBR: Styrene-butadiene rubber.

**1.4 ACTION SUBMITTALS**

- A. Product Data: For each type of valve.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Prepare valves for shipping as follows:
1. Protect internal parts against rust and corrosion.
  2. Protect threads, flange faces, and weld ends.
  3. Set valves open to minimize exposure of functional surfaces.
- B. Use the following precautions during storage:
1. Maintain valve end protection.

2. Store valves indoors and maintain at higher-than-ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use operating handles or stems as lifting or rigging points.
- D. Protect flanges and specialties from moisture and dirt.

## **PART 2 - PRODUCTS**

### **2.1 SOURCE LIMITATIONS**

- A. Obtain each type of valve from single manufacturer.

### **2.2 PERFORMANCE REQUIREMENTS**

- A. UL Listed: Valves shall be listed in UL's "Online Certifications Directory" under the headings listed below and shall bear UL mark:
  1. Fire Main Equipment: HAMV - Main Level
    - a. Indicator Posts, Gate Valve: HCBZ - Level 1
    - b. Ball Valves, System Control: HLUG - Level 3
    - c. Butterfly Valves: HLXS - Level 3
    - d. Check Valves: HMER - Level 3
    - e. Gate Valves: HMRZ - Level 3
  2. Sprinkler System & Water Spray System Devices: VDGT - Main Level
    - a. Valves, Trim and Drain: VQGU - Level 1
- B. FM Global Approved: Valves shall be listed in its "Approval Guide," under the headings listed below:
  1. Automated Sprinkler Systems:
    - a. Indicator posts.
    - b. Valves.
      - 1) Gate valves.
      - 2) Check valves
      - 3) Miscellaneous valves.
- C. ASME Compliance:
  1. ASME B1.20.1 for threads for threaded-end valves.
  2. ASME B16.1 for flanges on iron valves.
  3. ASME B31.9 for building services piping valves.
- D. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.

- E. NFPA Compliance for valves:
  - 1. Comply with NFPA 13, NFPA 14, NFPA 20, and NFPA 24.
- F. Valve Pressure Ratings: Not less than the minimum pressure rating indicated or higher, as required by system pressures.
- G. Valve Sizes: Same as upstream piping unless otherwise indicated.
- H. Valve Actuator Types:
  - 1. Worm-gear actuator with handwheel for quarter-turn valves, except for trim and drain valves.
  - 2. Handwheel: For other than quarter-turn trim and drain valves.
  - 3. Handlever: For quarter-turn trim and drain valves NPS 2 and smaller.

## **2.3 TWO-PIECE BALL VALVES WITH INDICATORS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. Ames Fire & Waterworks; A WATTS Brand.
  - 2. NIBCO INC.
  - 3. Victaulic Company.
  - 4. Or equal as approved by the Professional.
- B. Description:
  - 1. UL 1091, except with ball instead of disc and FM Global approved for indicating valves (butterfly or ball type), Class Number 1112.
  - 2. Minimum Pressure Rating: 175 psig.
  - 3. Body Design: Two piece.
  - 4. Body Material: Forged brass or bronze.
  - 5. Port Size: Full or standard.
  - 6. Seats: PTFE.
  - 7. Stem: Bronze or stainless steel.
  - 8. Ball: Chrome-plated brass.
  - 9. Actuator: Worm gear
  - 10. Supervisory Switch: Internal or external.
  - 11. End Connections for Valves NPS 1 through NPS 2: Threaded ends.
  - 12. End Connections for Valves NPS 2-1/2: Grooved ends.

## **2.4 BRONZE BUTTERFLY VALVES WITH INDICATORS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  - 1. ALEUM USA.
  - 2. Globe Fire Sprinkler Corporation.
  - 3. Milwaukee Valve Company.
  - 4. Or equal as approved by the Professional.

B. Description:

1. Standard: UL 1091 and FM Global standard for indicating valves, (butterfly or ball type), Class Number 1112.
2. Minimum: Pressure rating: 175 psig.
3. Body Material: Bronze.
4. Seat Material: EPDM.
5. Stem Material: Bronze or stainless steel.
6. Disc: Bronze or Stainless steel.
7. Actuator: Worm gear.
8. Supervisory Switch: Internal or external.
9. Ends Connections for Valves NPS 1 through NPS 2: Threaded ends.
10. Ends Connections for Valves NPS 2-1/2: Grooved ends.

## 2.5 IRON BUTTERFLY VALVES WITH INDICATORS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Anvil International/Smith-Cooper International; Tailwind Capital, LLC.
2. Globe Fire Sprinkler Corporation.
3. Kennedy Valve Company; a division of McWane, Inc.
4. NIBCO INC.
5. Victaulic Company.
6. Or equal as approved by the Professional.

B. Description:

1. Standard: UL 1091 and FM Global standard for indicating valves, (butterfly or ball type), Class Number 112.
2. Minimum Pressure Rating: 175 psig.
3. Body Material: Cast or ductile iron with nylon, EPDM, epoxy, or polyamide coating.
4. Seat Material: EPDM.
5. Stem: Stainless steel.
6. Disc: Ductile iron, nickel plated.
7. Actuator: Worm gear.
8. Supervisory Switch: Internal or external.
9. Body Design: Lug, wafer or Grooved-end connections.

## 2.6 CHECK VALVES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Ames Fire & Waterworks; A WATTS Brand.
2. Anvil International/Smith-Cooper International; Tailwind Capital, LLC.
3. Kennedy Valve Company; a division of McWane, Inc.
4. Mueller Co.
5. NIBCO INC.
6. Or equal as approved by the Professional.

B. Description:

1. Standard: UL 312 and FM Global standard for swing check valves, Class Number 1210.
2. Minimum Pressure Rating: 175 psig.
3. Type: Single swing check.
4. Body Material: Cast iron, ductile iron, or bronze.
5. Clapper: Bronze, ductile iron, or stainless steel with elastomeric seal.
6. Clapper Seat: Brass, bronze, or stainless steel.
7. Hinge Shaft: Bronze or stainless steel.
8. Hinge Spring: Stainless steel.
9. End Connections: Flanged, grooved, or threaded.

## **2.7 BRONZE OS&Y GATE VALVES**

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Milwaukee Valve Company.
2. NIBCO INC.
3. Zurn Industries, LLC.
4. Or equal as approved by the Professional.

B. Description:

1. Standard: UL 262 and FM Global standard for fire-service water control valves (OS&Y- and NRS-type gate valves).
2. Minimum Pressure Rating: 175 psig.
3. Body and Bonnet Material: Bronze or brass.
4. Wedge: One-piece bronze or brass.
5. Wedge Seat: Bronze.
6. Stem: Bronze or brass.
7. Packing: Non-asbestos PTFE.
8. Supervisory Switch: External.
9. End Connections: Threaded.

## **2.8 IRON O S &Y GATE VALVES**

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. Hammond Valve.
2. Kennedy Valve Company; a division of McWane, Inc.
3. Mueller Co.
4. NIBCO INC.
5. Victaulic Company.
6. WATTS.
7. Or equal as approved by the Professional.

B. Description:

1. Standard: UL 262 and FM Global standard for fire-service water control valves (OS&Y- and NRS-type gate valves).

2. Minimum Pressure Rating: 175 psig.
3. Body and Bonnet Material: Cast or ductile iron.
4. Wedge: Cast or ductile iron, or bronze with elastomeric coating.
5. Wedge Seat: Cast or ductile iron, or bronze with elastomeric coating.
6. Stem: Brass or bronze.
7. Packing: Non-asbestos PTFE.
8. Supervisory Switch: External.
9. End Connections: Flanged or Grooved.

## 2.9 NRS GATE VALVES

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
  1. Kennedy Valve Company; a division of McWane, Inc.
  2. Mueller Co.
  3. NIBCO INC.
  4. Victaulic Company.
  5. Or equal as approved by the Professional.
- B. Description:
  1. Standard: UL 262 and FM Global standard for fire-service water control valves (OS&Y- and NRS-type gate valves).
  2. Minimum Pressure Rating: 175 psig.
  3. Body and Bonnet Material: Cast or ductile iron.
  4. Wedge: Cast or ductile iron with elastomeric coating.
  5. Wedge Seat: Cast or ductile iron, or bronze with elastomeric coating.
  6. Stem: Brass or bronze.
  7. Packing: Non-asbestos PTFE.
  8. Supervisory Switch: External.
  9. End Connections: Flanged or Grooved.

## 2.10 TRIM AND DRAIN VALVES

- A. Ball Valves:
  1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
    - a. Apollo Valves; a part of Aalberts Integrated Piping Systems.
    - b. Fire-End & Coker Corporation.
    - c. Milwaukee Valve Company.
    - d. NIBCO INC.
    - e. Potter Roemer LLC; a Division of Morris Group International.
    - f. Or equal as approved by the Professional.
  2. Description:
    - a. Pressure Rating: **[175 psig] [250 psig] [300 psig]**.
    - b. Body Design: Two piece.
    - c. Body Material: Forged brass or bronze.

- d. Port size: Full or standard.
- e. Seats: PTFE.
- f. Stem: Bronze or stainless steel.
- g. Ball: Chrome-plated brass.
- h. Actuator: Handlever.
- i. End Connections for Valves NPS 1 through NPS 2-1/2: Threaded ends.
- j. End Connections for Valves NPS 1-1/4 and NPS 2-1/2: Grooved ends.

**B. Angle Valves:**

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Fire Protection Products, Inc.
  - b. NIBCO INC.
  - c. United Brass Works, Inc.
  - d. Or equal as approved by the Professional.
- 2. Description:
  - a. Pressure Rating: 175 psig.
  - b. Body Material: Brass or bronze.
  - c. Ends: Threaded.
  - d. Stem: Bronze.
  - e. Disc: Bronze.
  - f. Packing: Asbestos free.
  - g. Hand wheel: Malleable iron, bronze, or aluminum.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

### **3.2 INSTALLATION, GENERAL**

- A. Comply with requirements in the following Sections for specific valve-installation requirements and applications:

1. Section 211313 "Wet-Pipe Sprinkler Systems" for application of valves in wet-pipe, fire-suppression sprinkler systems.
  2. Section 211316 "Dry-Pipe Sprinkler Systems" for application of valves in dry-pipe, fire-suppression sprinkler systems.
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- B. Install listed fire-protection shutoff valves supervised-open, located to control sources of water supply, except from fire-department connections. Install permanent identification signs, indicating portion of system controlled by each valve.
  - C. Install double-check valve assembly in each fire-protection water-supply connection.
  - D. Install valves having threaded connections with unions at each piece of equipment arranged to allow easy access, service, maintenance, and equipment removal without system shutdown. Provide separate support where necessary.
  - E. Install valves in horizontal piping with stem at or above the pipe center.
  - F. Install valves in position to allow full stem movement.
  - G. Install valve tags. Comply with requirements in Section 210553 "Identification for Fire-Suppression Piping and Equipment" for valve tags and schedules and signs on surfaces concealing valves; and the NFPA standard applying to the piping system in which valves are installed. Install permanent identification signs indicating the portion of system controlled by each valve.

**END OF SECTION**