



## **SECTION 23 05 23 - GENERAL-DUTY VALVES FOR HVAC PIPING**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. Section Includes:
  - 1. Gate valves.
  - 2. Globe valves.
  - 3. Ball valves.
  - 4. Plug valves.
  - 5. Butterfly valves.
  - 6. Check valves
  - 7. Pressure and Safety relieve valves.

#### **1.2 REFERENCES**

- A. ASTM International:
  - 1. ASTM A216 / A216M - Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service.
  - 2. ASTM D1785 - Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80, and 120.
- B. ASTM D4101 - Standard Specification for Propylene Injection and Extrusion Materials.

#### **1.3 SUBMITTALS**

- A. Product Data: Submit manufacturers catalog information with valve data and ratings for each service.

### **PART 2 - PRODUCTS**

#### **2.1 GATE VALVES**

- A. Manufacturers:
  - 1. **Crane.**
  - 2. **Milwaukee.**
  - 3. **Nibco**
- B. 2 inches and Smaller: MSS SP 80, Class 125, bronze body, bronze trim, threaded bonnet, rising stem, inside screw solid wedge disc, solder or threaded ends.



- C. 2-1/2 inches and Larger: MSS SP 70, Class 125, cast iron body, bronze trim, bolted bonnet, rising stem, hand-wheel, outside screw and yoke, solid wedge disc with bronze seat rings, flanged ends. Furnish chain-wheel operators for valves 6 inches and larger mounted over 8 feet above floor.

## **2.2 GLOBE VALVES**

### A. Manufacturers:

1. **Crane**
2. **Milwaukee**
3. **Nibco**

- B. 2 inches and Smaller: MSS SP 80, Class 125, bronze body, bronze trim, threaded bonnet, hand wheel, Buna-N composition disc, solder or threaded ends.

- C. 2-1/2 inches and Larger: MSS SP 85, Class 125, cast iron body, bronze trim, hand wheel, outside screw and yoke, flanged ends. Furnish chain-wheel operators for valves 6 inches and larger mounted over 8 feet above floor.

## **2.3 BALL VALVES**

### A. Manufacturers:

1. **Crane**
2. **Milwaukee**
3. **Nibco**

- B. 2 inches and Smaller: MSS SP 110, Class 150, bronze, two piece body, type 316 stainless steel ball, full port, teflon seats, blow-out proof stem, solder or threaded end and handle with balancing stops.

## **2.4 PLUG VALVES**

### A. Manufacturers:

1. **Nordstrom**
2. **Dezurik**
3. **Crane**

- B. 2 inches and Smaller: MSS SP 78, Class 300, cast iron construction, round port, full pipe area, pressure lubricated, teflon packing, threaded ends. Furnish one plug valve wrench for every ten plug-valves with minimum of one wrench.

- C. 2-1/2 inches and Larger: MSS SP 78, Class 300, cast iron construction, round port, full pipe area, pressure lubricated, teflon packing, flanged ends. Furnish wrench-operated or worm gear-operated.



## 2.5 BUTTERFLY VALVES

- A. Manufacturers:
  - 1. **Crane**
  - 2. **Milwaukee**
  - 3. **Nibco**
- B. 2-1/2 inches and Larger: MSS SP 67, Class 200.
  - 1. Body: Cast or ductile iron, lug or grooved ends, stainless steel stem, extended neck.
  - 2. Disc: Aluminum bronze.
  - 3. Seat: Resilient replaceable EPDM.
  - 4. Handle and Operator: Infinite position lever handle with memory stop. Furnish gear operators for valves 8 inches and larger, and chain-wheel operators for valves mounted over 8 feet above floor.

## 2.6 CHECK VALVES

- A. Horizontal Swing Check Valves:
  - 1. Manufacturers:
    - a. **Crane**
    - b. **Milwaukee**
    - c. **Nibco**
  - 2. 2 inches and Smaller: MSS SP 80, Class 150, bronze body and cap, bronze seat, Buna-N, solder or threaded ends.
  - 3. 2-1/2 inches and Larger: MSS SP 71, Class 125, cast iron body, bolted cap, bronze or cast iron disc, renewable disc seal and seat, flanged ends.
- B. Spring Loaded Check Valves:
  - 1. Manufacturers:
    - a. **Crane.**
    - b. **Milwaukee**
    - c. **Nibco**
  - 2. 2 inches and Smaller: MSS SP 80, Class 250, bronze body, in-line spring lift check, silent closing, Buna-N disc, integral seat, solder or threaded ends.
  - 3. 2-1/2 inches and Larger: MSS SP 71, Class 125, wafer style, cast iron body, bronze seat, center guided bronze disc, stainless steel spring and screws, flanged ends.



## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

- A. Install valves with stems upright or horizontal, not inverted.
- B. Install valves with clearance for installation of insulation and allowing access.
- C. Provide access where valves and fittings are not accessible.

### **3.2 VALVE APPLICATIONS**

- A. Install shutoff and drain valves at locations in accordance with this Section.
- B. Install butterfly or gate valves for shut-off and to isolate equipment, part of systems, or vertical risers.
- C. Install ball butterfly or globe valves for throttling, bypass, or manual flow control services.
- D. Install spring loaded check valves on discharge of water pumps.
- E. Install lug end butterfly valves adjacent to equipment when functioning to isolate equipment.
- F. If valve applications are not indicated, use the following:
  - 1. Shutoff Service: Ball, butterfly gate, or plug valves.
  - 2. Butterfly Valve Dead-End Service: Single-flange (lug) type.
  - 3. Throttling and By-Pass Service: Globe, ball, or butterfly valves.
  - 4. Pump-Discharge Check Valves: Center-guided silent check valves.
  - 5. Lubricated plug valves may be used for throttling service. Non-lubricated plug valves may be used only when shut-off or isolating valves are also provided.
  - 6. Install drain valves, with cap and chain, as noted.
    - a. All applications use 3/4 inch ball or globe valves.
  - 7. Provide 1/4 inch ball valve as gauge cocks.
- G. Safety and Relief Valves:
  - 1. Constructed, rated and stamped in accordance with ASME
    - a. Install relief valves for unheated liquids.
    - b. Install safety relief valves for heated liquids.
    - c. Install safety valves for steam.
  - 2. Set Pressures and Ratings:
    - a. Suitable and rated for system pressure and temperature.



- 1) For Safety Relief Valves: Minimum temperature rating shall be equal to saturated steam temperature corresponding to pressure 10 percent higher than valve set pressure.
  - b. Set pressure; not to exceed pressure rating of protected equipment.
  3. Valves to open, under test, at set pressure with following tolerance:
    - a. Set pressure up to 70 psi: Plus or minus 2 psi.
    - b. Set pressure, above 70 psi: Plus or minus 3 percent.
  4. Capacities: Selected and sized to:
    - a. Relieve maximum possible generated energy.
    - b. Maintain pressure in protected equipment at not more than following:
      - 1) Low Pressure Boilers: 5 psi above boiler working pressure.
      - 2) Unfired Pressure Vessels: 10 percent above vessel working pressure.
  5. Provide multiple valves if required to meet capacity requirements.
- H. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.
- I. Select valves, with the following end connections:
1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
  2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
  3. For Copper Tubing, NPS 5 and Larger: Flanged ends.
  4. For Steel Piping, NPS 2 and Smaller: Threaded ends.
  5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
  6. For Steel Piping, NPS 5 and Larger: Flanged ends.
  7. For Grooved-End Copper Tubing and Steel Piping except Steam and Steam Condensate Piping: Valve ends may be grooved.

### **3.3 CHILLED-WATER VALVE SCHEDULE**

- A. Pipe NPS 2 and Smaller:
1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
  2. Ball Valves: Two piece, full port, brass with brass trim.
  3. Bronze Swing Check Valves: Class 125, bronze disc.
  4. Bronze Gate Valves: Class 125, RS, bronze.
  5. Bronze Globe Valves: Class 125, bronze disc.



- B. Pipe NPS 2-1/2 and Larger:
1. Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
  2. Iron, Single-Flange Butterfly Valves, NPS 2-1/2 to NPS 12: 200 CWP, EPDM seat, aluminum-bronze disc.
  3. Iron, Single-Flange Butterfly Valves, NPS 14 to NPS 24: 150 CWP, EPDM seat, aluminum-bronze disc.
  4. Iron, Grooved-End Butterfly Valves, NPS 2-1/2 to NPS 12: 175 CWP.
  5. Iron Swing Check Valves: Class 125, metal seats.
  6. Iron, Grooved-End Check Valves, NPS 3 to NPS 12: 300 CWP.
  7. Iron, Center-Guided Check Valves: Class 125, globe, metal seat.
  8. Iron Gate Valves: Class 125, OS&Y.
  9. Iron Globe Valves: Class 125.
  10. Lubricated Plug Valves: Class 125, regular gland, flanged.

### **3.4 HEATING-WATER VALVE SCHEDULE**

- A. Pipe NPS 2 and Smaller:
1. Bronze and Brass Valves: May be provided with solder-joint ends instead of threaded ends.
  2. Ball Valves: Two piece, full port, brass with brass trim.
  3. Bronze Swing Check Valves: Class 125, bronze disc.
  4. Bronze Gate Valves: Class 125, RS.
  5. Bronze Globe Valves: Class 125, bronze disc.
- B. Pipe NPS 2-1/2 and Larger:
1. Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
  2. Iron, Single-Flange Butterfly Valves, NPS 2-1/2 to NPS 12: 200 CWP, EPDM seat, aluminum-bronze disc.
  3. Iron, Single-Flange Butterfly Valves, NPS 14 to NPS 24: 150 CWP, EPDM seat, aluminum-bronze disc.
  4. Iron, Grooved-End Butterfly Valves, NPS 2-1/2 to NPS 12: 175 CWP.
  5. Iron Swing Check Valves: Class 125, metal seats.
  6. Iron, Grooved-End Check Valves, NPS 3 to NPS 12: 300 CWP.
  7. Iron, Center-Guided Check Valves: Class 125, globe, metal seat.
  8. Iron Gate Valves: Class 125, OS&Y.
  9. Iron Globe Valves, NPS 2-1/2 to NPS 12: Class 125.



END OF SECTION 23 05 23