SECTION 23 05 23.12 - BALL VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Bronze ball valves.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of valve.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR VALVES

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
B. ASME Compliance:
   1. ASME B1.20.1 for threads for threaded-end valves.
   2. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
   3. ASME B16.18 for solder-joint connections.
   4. ASME B31.1 for power piping valves.
   5. ASME B31.9 for building services piping valves.
C. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.
D. Refer to HVAC valve schedule articles for applications of valves.
E. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
F. Valve Sizes: Same as upstream piping unless otherwise indicated.
G. Valve Actuator Types:
   1. Gear Actuator: For quarter-turn valves NPS 4-inch and larger.
   2. Handlever: For quarter-turn valves smaller than NPS 4-inch.
H. Valves in Insulated Piping:
   1. Include 2-inch stem extensions.
   2. Extended operating handle of nonthermal-conductive material, and protective sleeves that allow operation of valves without breaking the vapor seals or disturbing insulation.
   3. Memory stops that are fully adjustable after insulation is applied.
I. Valve Bypass and Drain Connections: MSS SP-45.

2.02 BRONZE BALL VALVES

A. Bronze Ball Valves, Two-Piece with Full Port and Bronze or Brass Trim:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. American Valve, Inc.
      b. Apollo Valves; Conbraco Industries, Inc.
      c. Crane; Crane Energy Flow Solutions.
      d. Hammond Valve.
      e. Legend Valve & Fitting, Inc.
      f. Milwaukee Valve Company.
      g. NIBCO INC.
      h. Watts; a Watts Water Technologies company.
   2. Description:
      a. Standard: MSS SP-110.
      b. SWP Rating: 150 psig.
      c. CWP Rating: 600 psig.
      d. Body Design: Two piece.
      e. Body Material: Bronze.
      f. Ends: Threaded.
      g. Seats: PTFE.
      h. Stem: Bronze.
      i. Ball: Chrome-plated brass.

PART 3 - EXECUTION

3.01 VALVE INSTALLATION

A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
B. Locate valves for easy access and provide separate support where necessary.
C. Install valves in horizontal piping with stem at or above center of pipe.
D. Install valves in position to allow full stem movement.

3.02 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valves with specified SWP classes or CWP ratings are unavailable, the same types of valves with higher SWP classes or CWP ratings may be substituted.
B. Select valves with the following end connections:
   1. For Copper Tubing, NPS 2-inch and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
   2. For Steel Piping, NPS 2-inch and Smaller: Threaded ends.

3.03 CHILLED-WATER VALVE SCHEDULE

A. Pipe NPS 2-inch and Smaller: Bronze ball valves, two pieces, with bronze trim, and full port.

1. Valves may be provided with solder-joint ends instead of threaded ends.

3.04 HEATING-WATER VALVE SCHEDULE

A. Pipe NPS 2-inch and Smaller: Bronze ball valves, two pieces, with bronze trim, and full port.
   1. Valves may be provided with solder-joint ends instead of threaded ends.

END OF SECTION

SECTION 23 05 23.13 - BUTTERFLY VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Iron, single-flange butterfly valves.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of valve.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR VALVES

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
B. ASME Compliance:
   1. ASME B16.1 for flanges on iron valves.
   2. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
   3. ASME B31.1 for power piping valves.
   4. ASME B31.9 for building services piping valves.
C. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
D. Valve Sizes: Same as upstream piping unless otherwise indicated.
E. Valve Actuator Types:
   1. Gear Actuator: For valves NPS 8-inch and larger.
   2. Handlever: For valves NPS 6-inch and smaller.
   3. Chainwheel: Device for attachment to gear, stem, or other actuator of size and with chain for mounting height, according to "Valve Installation" Article.
F. Valves in Insulated Piping: With 2-inch stem extensions with extended necks.

2.02 IRON, SINGLE-FLANGE BUTTERFLY VALVES

A. Iron, Single-Flange Butterfly Valves with Aluminum-Bronze Disc:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Apollo Valves; Conbraco Industries, Inc.
      b. Hammond Valve.
      c. Jenkins Valves; Crane Energy Flow Solutions.
      d. Milwaukee Valve Company.
      e. NIBCO INC.
      f. Spence Engineering Company, Inc.
      g. Stockham; Crane Energy Flow Solutions.

h. Tyco Valves & Controls.
i. Watts; a Watts Water Technologies company.

2. Description:
a. Standard: MSS SP-67, Type I.
b. CWP Rating: 150 psig 200 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: EPDM.
f. Stem: One or two-piece stainless steel.
g. Disc: Aluminum bronze.

B. Iron, Single-Flange Butterfly Valves with Ductile-Iron Disc:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Apollo Valves; Conbraco Industries, Inc.
b. Center Line; Crane Energy Flow Solutions.
c. Hammond Valve.
d. Jomar Valve.
e. Milwaukee Valve Company.
f. Mueller Steam Specialty.
g. NIBCO INC.
h. Spence Engineering Company, Inc.
i. Stockham; Crane Energy Flow Solutions.
j. Tyco Valves & Controls.
k. Watts; a Watts Water Technologies company.

2. Description:
a. Standard: MSS SP-67, Type I.
b. CWP Rating: 150 psig 200 psig.
c. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
d. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
e. Seat: EPDM.
f. Stem: One- or two-piece stainless steel.
g. Disc: Nickel-plated ductile iron.

PART 3 - EXECUTION

3.01 VALVE INSTALLATION

A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
B. Locate valves for easy access and provide separate support where necessary.
C. Install valves in horizontal piping with stem at or above center of pipe.
D. Install valves in position to allow full stem movement.
E. Install chainwheels on operators for butterfly valves NPS 4-inch and larger and more than 96 inches above floor. Extend chains to 60 inches above finished floor.

3.02 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.03 CHILLED-WATER VALVE SCHEDULE

A. Pipe NPS 2 ½ -inch and Larger:
   1 Iron, Single-Flange Butterfly Valves, NPS 2 ½ - inch to NPS 12-inch: Aluminum-bronze Ductile-iron Stainless-steel disc, 200 CWP, and EPDM seat.

3.04 HEATING-WATER VALVE SCHEDULE

A. Pipe NPS 2 ½ -inch and Larger:
   1. Iron, Single-Flange Butterfly Valves, NPS 2 ½ -inch to NPS 12-inch: Aluminum-bronze Ductile-iron Stainless-steel disc, 200 CWP, and EPDM seat.

END OF SECTION

SECTION 23 05 23.14 - CHECK VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Bronze lift check valves.
   2. Bronze swing check valves.
   3. Iron swing check valves.

1.02 ACTION SUBMITTALS

A. Product Data: For each type of valve.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR VALVES

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
B. ASME Compliance:
   1. ASME B1.20.1 for threads for threaded-end valves.
   2. ASME B16.1 for flanges on iron valves.
   3. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
   4. ASME B16.18 for solder joint.
   5. ASME B31.1 for power piping valves.
   6. ASME B31.9 for building services piping valves.
C. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.
D. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
E. Valve Sizes: Same as upstream piping unless otherwise indicated.
F. Valve Bypass and Drain Connections: MSS SP-45.

2.02 BRONZE SWING CHECK VALVES

A. Bronze Swing Check Valves with Bronze Disc, Class 125:
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. American Valve, Inc.
      b. Crane; Crane Energy Flow Solutions.
      c. Hammond Valve.
      d. Jenkins Valves; Crane Energy Flow Solutions.
      e. Jomar Valve.
      f. KITZ Corporation.

g. Milwaukee Valve Company.
h. NIBCO INC.
i. Powell Valves.
j. Stockham; Crane Energy Flow Solutions.
k. Watts; a Watts Water Technologies company.

2. Description:
a. Standard: MSS SP-80, Type 3.
b. CWP Rating: 200 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: Bronze.

B. Bronze Swing Check Valves with Nonmetallic Disc, Class 125:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane; Crane Energy Flow Solutions.
b. Hammond Valve.
c. Jenkins Valves; Crane Energy Flow Solutions.
d. KITZ Corporation.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Stockham; Crane Energy Flow Solutions.
h. Watts; a Watts Water Technologies company.

2. Description:
a. Standard: MSS SP-80, Type 4.
b. CWP Rating: 200 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: PTFE.

C. Bronze Swing Check Valves with Bronze Disc, Class 150:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. American Valve, Inc.
b. Crane; Crane Energy Flow Solutions.
c. Jenkins Valves; Crane Energy Flow Solutions.
d. KITZ Corporation.
e. Milwaukee Valve Company.
f. NIBCO INC.
g. Stockham; Crane Energy Flow Solutions.

2. Description:
a. Standard: MSS SP-80, Type 3.
b. CWP Rating: 300 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: Bronze.

D. Bronze Swing Check Valves with Nonmetallic Disc, Class 150:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane; Crane Energy Flow Solutions.
b. Hammond Valve.

c. Jenkins Valves; Crane Energy Flow Solutions.
d. Milwaukee Valve Company.
e. NIBCO INC.
f. Watts; a Watts Water Technologies company.

2. Description:
a. Standard: MSS SP-80, Type 4.
b. CWP Rating: 300 psig.
c. Body Design: Horizontal flow.
d. Body Material: ASTM B 62, bronze.
e. Ends: Threaded.
f. Disc: PTFE.

2.03 IRON SWING CHECK VALVES

A. Iron Swing Check Valves with Metal Seats, Class 125:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane; Crane Energy Flow Solutions.
b. Hammond Valve.
c. Jenkins Valves; Crane Energy Flow Solutions.
d. KITZ Corporation.
e. Legend Valve & Fitting, Inc.
f. Milwaukee Valve Company.
g. NIBCO INC.
h. Stockham; Crane Energy Flow Solutions.
i. Watts; a Watts Water Technologies company.
2. Description:
a. Standard: MSS SP-71, Type I.
b. NPS 2 ½ -inch to NPS 12-inch, CWP Rating: 200 psig.
c. NPS 14-inch to NPS 24-inch, CWP Rating: 150 psig.
d. Body Design: Clear or full waterway.
e. Body Material: ASTM A 126, gray iron with bolted bonnet.
f. Ends: Flanged.
g. Trim: Bronze.
h. Gasket: Asbestos free.

B. Iron Swing Check Valves with Nonmetallic-to-Metal Seats, Class 125:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane; Crane Energy Flow Solutions.
b. Stockham; Crane Energy Flow Solutions.
2. Description:
a. Standard: MSS SP-71, Type I.
b. NPS 2 ½ -inch to NPS 12-inch, CWP Rating: 200 psig.
c. NPS 14-inch to NPS 24-inch, CWP Rating: 150 psig.
d. Body Design: Clear or full waterway.
e. Body Material: ASTM A 126, gray iron with bolted bonnet.
f. Ends: Flanged.
g. Trim: Composition.
h. Seat Ring: Bronze.
i. Disc Holder: Bronze.
j. Disc: PTFE.
k. Gasket: Asbestos free.

C. Iron Swing Check Valves with Metal Seats, Class 250:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane; Crane Energy Flow Solutions.
b. Hammond Valve.
c. Jenkins Valves; Crane Energy Flow Solutions.
d. Milwaukee Valve Company.
e. NIBCO INC.
f. Stockham; Crane Energy Flow Solutions.
g. Watts; a Watts Water Technologies company.
2. Description:
a. Standard: MSS SP-71, Type I.
b. NPS 2 ½ -inch to NPS 12-inch, CWP Rating: 500 psig.
c. NPS 14-inch to NPS 24-inch, CWP Rating: 300 psig.
d. Body Design: Clear or full waterway.
e. Body Material: ASTM A 126, gray iron with bolted bonnet.
f. Ends: Flanged.
g. Trim: Bronze.
h. Gasket: Asbestos free.

2.04 IRON SWING CHECK VALVES WITH CLOSURE CONTROL

A. Iron Swing Check Valves with Lever- and Spring-Closure Control, Class 125:
1. Manufacturers: Subject to compliance with requirements, provide products by the following:
a. NIBCO INC.
2. Description:
a. Standard: MSS SP-71, Type I.
b. NPS 2 ½ -inch to NPS 12-inch, CWP Rating: 200 psig.
c. NPS 14-inch to NPS 24-inch, CWP Rating: 150 psig.
d. Body Design: Clear or full waterway.
e. Body Material: ASTM A 126, gray iron with bolted bonnet.
f. Ends: Flanged.
g. Trim: Bronze.
h. Gasket: Asbestos free.
i. Closure Control: Factory installed, exterior lever and spring.

B. Iron Swing Check Valves with Lever and Weight-Closure Control, Class 125:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
a. Crane; Crane Energy Flow Solutions.
b. Hammond Valve.
c. Jenkins Valves; Crane Energy Flow Solutions.
d. Milwaukee Valve Company.
e. NIBCO INC.
f. Stockham; Crane Energy Flow Solutions.
g. Watts; a Watts Water Technologies company.
2. Description:
a. Standard: MSS SP-71, Type I.
b. NPS 2 ½ -inch to NPS 12-inch, CWP Rating: 200 psig.
c. NPS 14-inch to NPS 24-inch, CWP Rating: 150 psig.
d. Body Design: Clear or full waterway.
e. Body Material: ASTM A 126, gray iron with bolted bonnet.
f. Ends: Flanged.

g. Trim: Bronze.
h. Gasket: Asbestos free.
i. Closure Control: Factory-installed, exterior lever and weight.

PART 3 - EXECUTION

3.01 VALVE INSTALLATION

A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
B. Locate valves for easy access and provide separate support where necessary.
C. Install valves in horizontal piping with stem at or above center of pipe.
D. Install valves in position to allow full stem movement.
E. Install swing check valves for proper direction of flow in horizontal position with hinge pin level.

3.02 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.03 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:
   1. Pump-Discharge Check Valves:
      a. NPS 2-inch and Smaller: Bronze swing check valves with bronze disc.
      b. NPS 2 ½ -inch and Larger: Iron swing check valves with lever and weight or with spring; metal-seat check valves.
B. If valves with specified SWP classes or CWP ratings are unavailable, the same types of valves with higher SWP classes or CWP ratings may be substituted.
C. Select valves, except wafer.
   1. For Copper Tubing, NPS 2-inch and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules.
   2. For Copper Tubing, NPS 2 ½ -inch to NPS 4-inch: Flanged ends except where threaded valve-end option is indicated in valve schedules.
   3. For Copper Tubing, NPS 5-inch and Larger: Flanged ends.
   4. For Steel Piping, NPS 2-inch and Smaller: Threaded ends.
   5. For Steel Piping, NPS 2 ½ to NPS 4-inch: Flanged ends except where threaded valve-end option is indicated in valve schedules.
   6. For Steel Piping, NPS 5-inch and Larger: Flanged ends.

3.04 CHILLED-WATER VALVE SCHEDULE

A. Pipe NPS 2-inch and Smaller:
   1. Bronze Valves: May be provided with solder-joint ends instead of threaded ends.
   2. Bronze swing check valves with bronze disc, Class 125.
B. Pipe NPS 2 ½ -inch and Larger:
   1. Iron Valves, NPS 2 ½ -inch to NPS 4-inch: May be provided with threaded ends instead of flanged ends.
   2. NPS 2 ½ -inch to NPS 12-inch: Iron swing check valves with lever and spring closure control,

Class 125.

3. Iron swing check valves with metal seats, Class 125.

3.05 HEATING-WATER VALVE SCHEDULE

A. Pipe NPS 2-inch and Smaller:
   1. Bronze Valves: May be provided with solder-joint ends instead of threaded ends.
   2. Bronze swing check valves with bronze disc, Class 125.

B. Pipe NPS 2 ½ -inch and Larger:
   1. Iron Valves, NPS 2 ½ -inch to NPS 4-inch: May be provided with threaded ends instead of flanged ends.
   2. NPS 2 ½ -inch to NPS 12-inch: Iron swing check valves with lever and spring-closure control, Class 125.
   3. Iron swing check valves with metal seats, Class 125.

END OF SECTION