SECTION 21 05 23

GENERAL-DUTY VALVES FOR WATER-BASED

FIRE-SUPPRESSION PIPING

**PART 1 GENERAL**

1. **SECTION INCLUDES**
2. Two-piece ball valves with indicators.
3. Iron butterfly valves with indicators.
4. Check valves.
5. Iron OS&Y gate valves.
6. NRS gate valves.
7. Indicator posts.
8. Trim and drain valves.
9. **RELATED REQUIREMENTS**
10. Section 07 8400 – Fire stopping from csi
11. Section 21 0500 - Common Work Results for Fire Suppression: Pipe and fittings.
12. Section 21 0548 - Vibration and Seismic Controls for Fire Suppression Piping and Equipment.
13. Section 21 0553 - Identification for Fire Suppression Piping and Equipment.
14. Section 21 1300 - Fire Suppression Sprinklers.
15. **ABBREVIATIONS AND ACRONYMS**
16. EPDM: Ethylene-propylene dine monomer.
17. NRS: Non-rising stem.
18. OS&Y: Outside screw and yoke.
19. PTFE: Polytetrafluoroethylene.
20. **REFERENCE STANDARDS**
21. ASME B1.20.1 - Pipe Threads, General Purpose, Inch; The American Society of Mechanical Engineers; 2013.
22. ASME B16.1 - Gray Iron Pipe Flanges and Flanged Fittings: Classes 25, 125, and 250; The American Society of Mechanical Engineers; 2010.
23. ASME B31.9 - Building Services Piping; The American Society of Mechanical Engineers; 2011 (ANSI/ASME B31.9).
24. AWWA C606 - Grooved and Shouldered Joints; American Water Works Association; 2011 (ANSI/AWWA C606).
25. FM (AG) - FM Approval Guide; current edition.
26. FM Approval Guide; Factory Mutual Global; current edition.
27. NFPA 13 - Standard for the Installation of Sprinkler Systems; National Fire Protection Association; 2016.
28. UL (DIR) - Online Certifications Directory; Underwriters Laboratories Inc.; current listings at database.ul.com.
29. UL 262 - Gate Valves for Fire-Protection Service; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.
30. UL 312 - Check Valves for Fire-Protection Service; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.
31. UL 789 - Indicator Posts for Fire-Protection Service; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.
32. UL 1091 - Standard for Butterfly Valves for Fire-Protection Service; Current Edition, Including All Revisions.
33. UL 1091 - Butterfly Valves for Fire-Protection Service; Underwriters Laboratories Inc.; Current Edition, Including All Revisions.
34. **ADMINISTRATIVE REQUIREMENTS**
35. Pre installation Meeting: Conduct a pre installation meeting one week prior to the start of the work of this section; require attendance by all affected installers.
36. **SUBMITTALS**
37. See Section 01 3000 - Administrative Requirements, for submittal procedures.
38. Product Data: Provide data on valves including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
39. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Employer/Owner's name and registered with manufacturer.
40. Operation and Maintenance Data: Include manufacturer's descriptive literature, operating instructions, maintenance and repair data, and parts listings.
41. **QUALITY ASSURANCE**
42. Manufacturer Qualifications:
43. Obtain valves for each valve type from single manufacturer.
44. Company must specialize in manufacturing products specified in this section, with not less than ten years of documented experience.
45. Where listed products are specified, provide products listed, classified, and labeled by FM (AG), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for the purpose indicated.
46. Welding Materials and Procedures: Conform to ASME BPVC-IX.
47. Installer Qualifications:
48. Company specializing in performing the work of this section with minimum five years documented experience.
49. **DELIVERY, STORAGE, AND HANDLING**
50. Prepare valves for shipping as follows:
51. Protect internal parts against rust and corrosion.
52. Protect threads, flange faces, and weld ends.
53. Set valves open to minimize exposure of functional surfaces.
54. Use the following precautions during storage:
55. Maintain valve end protection and protect flanges and specialties from dirt.
56. Provide temporary inlet and outlet caps.
57. Maintain caps in place until installation.
58. Store valves in shipping containers and maintain in place until installation.
59. Store valves indoors and maintain at higher than ambient dew point temperature.
60. If outdoor storage is unavoidable, store valves off the ground in watertight enclosures.
61. Use the following precautions for handling:
62. Use sling to handle large valves, rigged to avoid damage to exposed parts.
63. Do not use operating handles or stems as lifting or rigging points.

**PART 2 PRODUCTS**

* 1. **GENERAL REQUIREMENTS**

A. UL Listed: Provide valves listed in UL (DIR) under following headings and bearing UL mark:

1. Main Level: HAMV - Fire Main Equipment.

Level 1: HCBZ - Indicator Posts, Gate Valve.

Level 1: HLOT - Valves.

Level 3: HLUG - Ball Valves, System Control.

Level 3: HLXS - Butterfly Valves.

Level 3: HMER - Check Valves.

Level 3: HMRZ - Gate Valves.

1. Main Level: VDGT - Sprinkler System & Water Spray System Devices.
2. Level 1: VQGU - Valves, Trim, and Drain.
3. Factory Mutual (FM) Global Approved: Provide valves listed in FM Approval Guide under the following headings:
4. Automated Sprinkler Systems:
5. Indicator posts.
6. Valves:
7. Gate valves.
8. Single check valves.
9. Miscellaneous valves.
10. ASME Compliance:
11. ASME B16.1 for flanges on iron valves.
12. ASME B1.20.1 for threads on threaded-end valves.
13. ASME B31.9 for building services piping valves.
14. Comply with AWWA C606 for grooved-end connections.
15. Comply with NFPA 13 and NFPA 14 and NFPA 24 for valves.
16. Valve Pressure Ratings: Not less than minimum pressure rating indicated or 1.5 times system pressure.
17. Valve Sizes: Same as upstream piping unless otherwise indicated.
18. Valve Actuator Types:
19. Worm-gear actuator with hand wheel for quarter-turn valves, except trim and drain valves.
20. Hand wheel: For other than quarter-turn trim and drain valves.
21. Hand-lever: For quarter-turn trim and drain valves 50 DN (2 NPS) and smaller.
22. All valves shall be lockable.
    1. **TWO-PIECE BALL VALVES WITH INDICATORS**
23. UL 1091, except with ball instead of disc and FM standard listing for indicating valves (butterfly or ball type), Class Number 1112.
24. Description:
25. Minimum Pressure Rating: 1200 kPa (175 psig).
26. Body Design: Two piece.
27. Body Material: Forged brass or bronze.
28. Port Size: Full or standard.
29. Seat: PTFE.
30. Stem: Bronze or stainless steel.
31. Ball: Chrome-plated brass.
32. Actuator: Worm gear or traveling nut.
    1. **IRON BUTTERFLY VALVES WITH INDICATORS**
33. UL 1091 and FM standard listing for indicating valves (butterfly or ball type), Class Number 112.
34. Minimum Pressure Rating: 1200 kPa (175 psig).
35. Body Material: Cast or ductile iron with nylon, EPDM, epoxy, polyamide, or any proper coating.
36. Seat: EPDM.
37. Stem: Stainless steel.
38. Disc: Ductile iron, nickel plated.
39. Actuator: Worm gear or traveling nut.
40. Supervisory Switch: Internal or external.
41. Body Design: Grooved-end connections.
    1. **CHECK VALVES**
42. UL 312 and FM standard listing for check valves, Class Number 1045.
43. Minimum Pressure Rating: 1200 kPa (175 psig).
44. Type: Center guided check valve.
45. Body Material: Cast iron, ductile iron.
46. Center guided check with elastomeric seal.
47. Hinge Spring: Stainless steel.
48. End Connections: Flanged, grooved, or threaded.
    1. **IRON OS&Y GATE VALVES**
49. UL 262 and FM standard listing for fire-service water control valves (OS&Y and NRS-type gate valves).
50. Minimum Pressure Rating: 1200 kPa (175 psig).
51. Body and Bonnet Material: Cast or ductile iron.
52. Wedge: Cast or ductile iron, or bronze with elastomeric coating.
53. Wedge Seat: Cast or ductile iron, or bronze with elastomeric coating.
54. Stem: Brass or bronze.
55. Packing: Non-asbestos PTFE.
56. End Connections: Flanged or grooved ends.
    1. **NRS GATE VALVES**
57. UL 262 and FM standard listing for fire-service water control valves (OS&Y and NRS-type gate valves).
58. Minimum Pressure Rating: 1200 kPa (175 psig) or system pressure whatever is greater.
59. Body and Bonnet Material: Cast or ductile iron.
60. Wedge: Cast or ductile iron with elastomeric coating.
61. Stem: Brass or bronze.
62. Packing: Non-asbestos PTFE.
63. Supervisory Switch: External.
64. End Connections: Flanged.

* 1. **INDICATOR POSTS**

1. UL 789 and FM standard listing for indicator posts.
2. Type: Underground.
3. Base Barrel Material: Cast or ductile iron.
4. Extension Barrel for Adjustable Length Indicator Posts: Cast or ductile iron.
5. Cap: Cast or ductile iron.
6. Operation: Wrench. 
   1. **TRIM AND DRAIN VALVES**
7. Ball Valves:
8. Description:
9. Pressure Rating: 1200 kPa (175 psig).
10. Body Design: Two piece.
11. Body Material: Forged brass or bronze.
12. Port Size: Full or standard.
13. Seat: PTFE.
14. Stem: Bronze or stainless steel.
15. Ball: Chrome-plated brass.
16. Actuator: Hand-lever.
17. End Connections for Valves 25 DN (1 NPS) through 65 DN (2-1/2 NPS): Threaded ends.
18. Angle Valves:
19. Description:
20. Pressure Rating: 1200 KPa (175 psig).
21. Body Material: Brass or bronze.
22. Ends: Threaded.
23. Stem: Bronze.
24. Disc: Bronze.
25. Packing: Asbestos free.
26. Hand wheel: Malleable iron, bronze, or aluminum.
27. Globe Valves:

1. Description:

1. Pressure Rating: 1200 KPa (175 psig).
2. Body Material: Bronze with integral seat and screw-in bonnet.
3. Ends: Threaded.
4. Stem: Bronze.
5. Disc Holder and Nut: Bronze.
6. Disc Seat: Nitrile.
7. Packing: Asbestos free.
8. Hand wheel: Malleable iron, bronze, or aluminum.

**PART 3 EXECUTION**

1. **EXAMINATION**
2. Confirm valve interior to be free of foreign matter and corrosion.
3. Remove packing materials.
4. Examine guides and seats by operating valves from the fully open position to the fully closed position.
5. Examine valve threads and mating pipe for form and cleanliness.
6. Examine mating flange faces for conditions that might cause leakage.
7. Check bolting for proper size, length, and material.
8. Verify gasket for size, defects, damage, and suitable material composition for service.
9. Replace all defective valves with new valves.
10. **INSTALLATION**
11. Comply with specific valve installation requirements and application in the following Sections:
12. Section 21 1200 for application of valves in fire-suppression standpipes.
13. Section 21 1300 for application of valves in wet and dry pipe, fire-suppression sprinkler systems.
14. Install listed fire protection shutoff valves supervised-open, located to control sources of water supply except from fire department connections.
15. Install permanent identification signs indicating portion of system controlled by each valve.
16. Valves with threaded connections to have unions at equipment arranged for easy access, service, maintenance, and equipment removal without system shutdown.
17. Valves in horizontal piping installed with stem at or above the pipe center.
18. Position valves to allow full stem movement.
19. Install valve tags. Comply with Section 21 0553 requirements for valve tags, schedules, and signs on surfaces concealing valves; and the appropriate NFPA standard and local codes applying to the piping system in which valves are installed.

**END OF SECTION**