UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2021
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SECTION TABLE OF CONTENTS

DIVISION 23 - HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)

SECTION 23 22 25.00 40

STEAM VALVES

11/17

PART 1 GENERAL

1.1 REFERENCES
1.2 ADMINISTRATIVE REQUIREMENTS
1.2.1 Preinstallation Meetings
1.3 SUBMITTALS

PART 2 PRODUCTS

2.1 COMPONENTS
2.1.1 Dial Cocks
2.1.2 Diaphragm Control and Instrument Valves (DCIV)
2.2 FABRICATION
2.2.1 Gate Valves
2.2.1.1 Gate Valves 2500 kPa 350 psi
2.2.1.2 Gate Valves 1100 kPa 150 psi
2.2.1.3 Gate Valves 900 kPa 125 psi
2.2.2 Globe and Angle Valves
2.2.2.1 Globe and Angle Valves 2500 kPa 350 psi
2.2.2.2 Globe and Angle Valves 1100 kPa 150 psi
2.2.2.3 Globe and Angle Valves 900 kPa 125 psi
2.2.3 Check Valves
2.2.3.1 Check Valves 2500 kPa 350 psi
2.2.3.2 Check Valves 900 kPa 125 psi
2.2.3.3 Manual Radiator Valves
2.2.4 Cone-Plug Balancing Valve (CPBV)
2.2.5 Eccentric Plug Valves (EPV)

PART 3 EXECUTION

3.1 INSTALLATION

-- End of Section Table of Contents --

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USACE / NAVFAC / AFCEC / NASA | **UFGS-23 22 25.00 40 (November 2017)**

Preparing Activity: NASA | **Superseding UFGS-23 22 25.00 40 (November 2014)**

UNIFIED FACILITIES GUIDE SPECIFICATIONS

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SECTION 23 22 25.00 40

STEAM VALVES
11/17

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NOTE: This guide specification covers the requirements for valves for steam and condensate systems.

Standard valves for steam, water, etc., operating at 178 degrees C and 900 kilopascal 353 degrees F and 125 pounds per square inch gage working steam pressure are covered in Section 23 05 15 COMMON PIPING FOR HVAC.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

****

PART 1 GENERAL

****

NOTE: If Section 23 30 00 HVAC AIR DISTRIBUTION is not included in the project specification, insert applicable requirements therefrom and delete the first paragraph. If Section 40 17 30.00 40 WELDING GENERAL PIPING is not included in the project specification, insert applicable requirements therefrom and delete the second paragraph.

****

[Section 23 30 00 HVAC AIR DISTRIBUTION applies to work specified in this

section.

][Section 40 17 30.00 40 WELDING GENERAL PIPING applies to work specified in this section.

]1.1 REFERENCES

****
NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.
****

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B1.20.1	(2013; R 2018) Pipe Threads, General Purpose (Inch)
ASME B1.20.2M	(2006; R 2011) Pipe Threads, 60 Deg. General Purpose (Metric)
ASME B16.1	(2020) Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250
ASME B16.34	(2017) Valves - Flanged, Threaded and Welding End

AMERICAN WELDING SOCIETY (AWS)

AWS A5.13/A5.13M	(2010) Specification for Surfacing Electrodes for Shielded Metal Arc Welding

ASTM INTERNATIONAL (ASTM)

ASTM A105/A105M	(2018) Standard Specification for Carbon Steel Forgings for Piping Applications
ASTM A106/A106M	(2019a) Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service

ASTM A126	(2004; R 2019) Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A182/A182M	(2020) Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service
ASTM A216/A216M	(2016) Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service
ASTM A436	(1984; R 2020) Standard Specification for Austenitic Gray Iron Castings
ASTM B61	(2015) Standard Specification for Steam or Valve Bronze Castings
ASTM B62	(2017) Standard Specification for Composition Bronze or Ounce Metal Castings

INTERNATIONAL SOCIETY OF AUTOMATION (ISA)

ISA RP60.9	(1981) Piping Guide for Control Centers

MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-70	(2011) Gray Iron Gate Valves, Flanged and Threaded Ends
MSS SP-80	(2019) Bronze Gate, Globe, Angle and Check Valves
MSS SP-86	(2014) Guidelines for Metric Data in Standards for Valves, Flanges, Fittings and Actuators

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

CID A-A-50457	(Rev A; Notice 2) Valves Radiator, Heating Packless Bonnett, Class 125 PSIG

1.2 ADMINISTRATIVE REQUIREMENTS

1.2.1 Preinstallation Meetings

Before work begins, submit the following to the Contracting Officer:

a. Listing of product installations for valve assemblies indicating at least [five] [_____] installed units, similar to those proposed for use, that have been in successful service for at least [5] [_____] years, with contact information for verification.

b. Certificates of conformance for the following items, showing conformance to the standards cited in this section:

(1) Gate Valves

(2) Globe and Angle Valves

(3) Check Valves

(4) Cone-Plug Balancing Valve

(5) Eccentric Plug Valves

(6) Dial Cocks

(7) Diaphragm Control and Instrument Valves

c. Fabrication drawings and installation drawings for each of the following used in the work:

(1) Valves

(2) Accessories

1.3 SUBMITTALS

****

NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a “G” to an item, if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

****

Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are [for Contractor Quality Control approval.][for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Fabrication Drawings; G[, [____]]

Installation Drawings; G[, [____]]

SD-03 Product Data

Dial Cocks; G[, [____]]

Diaphragm Control And Instrument Valves; G[, [____]]

Gate Valves; G[, [____]]

Globe And Angle Valves; G[, [____]]

Check Valves; G[, [____]]

Cone-Plug Balancing Valve; G[, [____]]

Eccentric Plug Valves; G[, [____]]

SD-07 Certificates

Certificates of Conformance

Listing of Product Installations

PART 2 PRODUCTS

2.1 COMPONENTS

2.1.1 Dial Cocks

Provide dial cocks in sizes 64 mm 2 1/2 inches (iron pipe size) ips and smaller with a pointer and etched position dial rated 1100 kilopascal 150 pounds per square inch (psi) working steam pressure (wsp) and made of the manufacturer's standard all-brass construction.

2.1.2 Diaphragm Control and Instrument Valves (DCIV)

Provide diaphragm control and instrument valves in sizes 8 mm and 10 mm 1/4 and 3/8 inch with a forged-brass body with a reinforced tetrafluoroethylene diaphragm, and an AISI 300 series corrosion-resistant steel spring. Fit the handle with disks color-coded in accordance with ISA RP60.9.

2.2 FABRICATION

2.2.1 Gate Valves

****
NOTE: These valves are recommended for steam and condensate service.
****

2.2.1.1 Gate Valves 2500 kPa 350 psi

Rate gate valves 2100 kilopascal 300 psi wsp with conformance to ASME B16.34.

Ensure that the body end connections are flanged for all valves larger than 50 mm 2 inches, unless butt-welding ends are specified. Use[screwed][socket] [welded] connections for sizes 50 mm 2-inches and under to the suit specified piping system end connections. Provide flange faces with a concentric serrated finish.

Provide a[union][gasketed-bolted] body-to-bonnet connection for valves that are 50 mm 2 inches and under and a gasketed-bolted connection for valves larger than 50 mm 2 inches. Select an outside screw and yoke (OS&Y) bonnet with a rising stem.

Provide a[cast steel][forged carbon steel] body-and-bonnet assembly. Provide certification that[cast steel conforms to ASTM A216/A216M, Grade WCB][forged carbon steel conforms to ASTM A105/A105M].

****
NOTE: Select the following paragraph only after checking flow coefficients.
****

[Provide full port valves.

] The trim includes a[hard-surfaced solid][one-piece flexible] wedge disc and hard-surfaced seats, with a rising and backseating stem.

Provide trim materials and hard-surfaced substrates[conforming to ASTM A182/A182M, Grade F6][of the manufacturer's standard metallurgical equivalents for the specified service].

Provide certification that the hard-surfacing alloy conforms to AWS A5.13/A5.13M,[Class RNiCr-B][Class RCoCr-B].

Provide a wire-reinforced packing fiber braid, impregnated with[30 percent tetrafluoroethylene][a corrosion-inhibiting lubricant specifically suitable for service with the stem material provided].

Provide[cast iron][malleable iron][wrought steel] valve wheels.

****
NOTE: Note on drawings all locations where an integral bypass valve is required. Integral bypass valves are used for valves larger than 150 mm 6 inches and for smaller sizes where unusual warm up operations occur.
****

Provide integral bypass globe valves around valves larger than 150 mm 6 inches. Ensure that the bypass valves are factory-installed and have a[butt][socket]-welded end conforming to the same requirements as the main valve, except that in all cases the valve seat and plug disk are hard surfaced and the seat is a removable, replaceable type. Provide pressure tubing piping connections conforming to Schedule 80 ASTM A106/A106M, Grade[B][C], and without change-of-direction fittings (i.e., bent piping). Ensure that the connection is made to valve bosses that are located to perform specified function.

****

NOTE: Note on drawings all locations where an integral drain valve is required. Integral drain valves are particularly useful in tall risers. Note integral drain valves in all cases where required except where the valve size is less than 50 mm 2 inches, in which case, provide an independent drain immediately above the valve. Note pitch of the horizontal lines.

****

Provide a[factory][field]-installed integral drain valve. Weld the connection to the main valve body. Provide a trimmed drain valve with the manufacturer's standard hardened corrosion-resistant steel. Provide pressure tubing piping conforming to ASTM A106/A106M, Grade[B][C]. Provide a[capped][plugged] drain discharge with a threaded closure assembly sealed with tetrafluoroethylene tape.

2.2.1.2 Gate Valves 1100 kPa 150 psi

Provide valves rated at 1100 kilopascal 150-psi (wsp) conforming to ASME B16.34.

Provide flanged-body end connections for all valves larger than 50 mm 2 inches unless butt weld ends are specified. Use[screwed][socket] connections for sizes 50 mm 2 inches and under to suit specified piping system end connections. Ensure that flange faces have a concentric serrated finish.

Provide a[union][gasketed-bolted] body-to-bonnet connection for valves 50 mm 2 inches and under and a gasketed-bolted connection for valves larger than 50 mm 2 inches. Provide an OS&Y bonnet with a rising stem.

Provide a[cast steel][forged carbon steel] body-and-bonnet assembly. Ensure that the [cast steel conforms to ASTM A216/A216M, Grade WCB][forged carbon steel conforms to ASTM A105/A105M].

****

NOTE: Select the following paragraph only after checking flow coefficients.

****

[Provide valves with a full port.

] Include a[hard surfaced solid][one-piece flexible-wedge] disk and hard-surfaced seats with trim for valves larger than 50 mm 2 inches. Provide trim for valves 50 mm 2 inches or smaller with[hard-surfaced][hardened-solid][one-piece flexible wedge disk] and[hard-surfaced][

hardened seats]. Ensure that the hardened components have a Brinell hardness of at least 500 and have a rising and backseating stem.

Provide a trim materials and hard-surfaced substrates[conforming to ASTM A182/A182M, Grade F6][selected from the manufacturer's standard metallurgical equivalents for the specified service].

Provide hard-surfacing alloy conforming to AWS A5.13/A5.13M,[Class RNiCr-B][Class RCoCr-B].

Provide wire-reinforced fiber braided packing, impregnated with[30 percent tetrafluoroethylene][a corrosion-inhibiting lubricant specifically suitable for service with the stem material provided].

Provide valve wheels of[cast iron][malleable iron][wrought steel].

****
NOTE: Note on the drawings all locations where an integral bypass valve is required. Integral bypass valves are used for valves larger than 150 mm 6 inches and for smaller valves where unusual warm-up operations occur.
****

Provide integral bypass globe valves around valves larger than 150 mm 6 inches. Factory-install bypass valves with a[butt][socket]-welded end, conforming to the same requirements as the main valve except that, in all cases, the valve seat and disk are hard-surfaced and seat is removable and replaceable. Provide pressure-tubing piping connections, conforming to Schedule 80 ASTM A106/A106M, Grade[B][C], and without fittings that require an additional change-of-direction fitting; (i.e., bent fitting).

****
NOTE: Note on the drawings all locations where an integral drain valve is required. Integral drain valves are particularly useful in tall risers. Note in all cases where required except where the valve size is less than 50 mm 2 inches, in which case provide an independent drain immediately above the valve. Note pitch of horizontal lines.
****

[Factory][Field]-install the integral drain valve assembly. Factory drill the main valve boss. Weld the connection to the main valve body. Trim the drain valve with the manufacturer's standard hardened corrosion-resistant steel. Provide pressure-tubing piping conforming to ASTM A106/A106M, Grade [B] [C]. [Cap][Plug]drain discharge, and seal threaded closure assembly with tetrafluoroethylene tape.

2.2.1.3 Gate Valves 900 kPa 125 psi

Provide wedge disc, rising stem, inside screw, valves rated 900 kilopascal 125 psi (wsp) that conform to MSS SP-80 for sizes 50 mm 2 inches and under, and that conform to MSS SP-70 for sizes over50 mm 2 inches.

For all valves larger than 50 mm 2 inches, provide flanged body end connections and screwed body end connections in sizes 50 mm 2 inches and under.

For valves in sizes 50 mm 2 inches and under, provide union-bonnet valves, made of cast iron conforming to ASTM A126, Class B.

Provide a rising and backseating stem.

Provide fiber braid packing impregnated with 30 percent tetrafluoroethylene.

Provide[cast iron][malleable iron][wrought steel] valve wheels.

****

NOTE: The following materials selection may be desirable as a means of eliminating dissimilar metal couples in a corrosive condensate. Forged steel valve cost premium on per-unit basis is approximately 100 percent.

Coordinate the following selection with appropriate selections for 1100 150-psi service valves.

****

For condensate service, provide screwed-end gate valves, 1100 kilopascal 150 psi, wsp-rated, forged steel, conforming to ASME B16.34, with the manufacturer's standard corrosion-resistant steel trim.

****

NOTE: Note on drawings all locations where an integral bypass valve is required. Integral bypass valves are used for valves larger than 150 mm 6 inches and where warm-up operations occur.

****

Provide integral bypass globe valves around valves larger than 150 mm 6 inches. Factory-install main valve body taps. Provide globe,[factory][field]-installed bypass valves, with a socket-welded end conforming to ASME B16.34. Ensure that the valve seat and plug disk are hard-surfaced and that seats are removable and replaceable. Provide pressure tubing piping connections conforming to Schedule 80 ASTM A106/A106M, Grade[B][C], without change-of-direction fittings (i.e., bent fittings), and include a 20700 kilopascal 3,000-psi-rated, forged steel union with a corrosion-resistant steel insert and a socket-welded end.

****

NOTE: Note on drawings all locations where an integral drain valve is required. Integral drain valves are particularly useful in tall risers. In all cases note where required, except where valve size is less than 50 mm 2 inches. In that case, provide an independent drain immediately above the valve. Note the pitch of horizontal lines.

****

Provide integral drain valves. Ensure that the main valve boss penetration has a factory-finish and is field installed. Provide a gate drain valve. Provide pressure tubing piping conforming to ASTM A106/A106M, Grade[B][C]. [Cap] [Plug] the drain discharge. Thread the closure assembly with tetrafluoroethylene tape.

2.2.2 Globe and Angle Valves

****

NOTE: These valves are recommended for steam and condensate service.

****

2.2.2.1 Globe and Angle Valves 2500 kPa 350 psi

Provide valves 2100 kilopascal rated 300 psi (wsp) conforming to ASME B16.34.

Provide flanged-body end connections for all valves larger than 50 mm 2 inches, unless butt-welding ends are specified. Use a[screwed][socket] weld for sizes 50 mm 2 inches and under to suit the specified piping system end connections. Provide valves with flange faces and a concentric serrated finish.

Provide a[union][gasketed-bolted] body-to-bonnet connection for valves50 mm 2 inches and under, a gasketed-bolted connection for valves larger than 50 mm 2 inches and for valves DN10 3/8 inch and under, use a screwed assembly. Ensure that an OS&Y bonnet is provided; for valves DN10 3/8 inchand under use an inside screw bonnet.

Provide a[cast steel][forged carbon steel] body-and-bonnet assembly, with cast steel conforming to ASTM A216/A216M, Grade WCB, or forged carbon steel conforming to ASTM A105/A105M.

Include in the trim a hard-surfaced plug disk and hard-surfaced seats, with a rising and backseating stem.

Provide trim materials and hard-surface substrates[conforming to ASTM A182/A182M, Grade F6][or the manufacturer's standard metallurgical equivalents for the specified service].

Ensure that the hard-surfacing alloy conforms to AWS A5.13/A5.13M,[Class RNiCr-B][Class RCoCr-B].

Provide wire-reinforced packing, fiber braid impregnated with[30 percent tetrafluoroethylene][a corrosion-inhibiting lubricant specifically suitable for service with the stem material provided].

Provide[cast iron][malleable iron][wrought steel] valve wheels.

****

NOTE: Note on the drawings all locations where an integral drain valve is required. Integral drain valves are particularly useful in risers. Note in all cases where required, except where valve size is less than 50 mm 2 inches. In that case, provide an independent drain immediately above the valve. Note the pitch of horizontal lines.

****

Provide integral drain valves, with the main valve boss penetration factory-finished and the drain assembly[factory][field]-installed. Weld the connection to the main valve body. Provide the trim drain valve with the manufacturer's standard hardened corrosion-resistant steel. Provide pressure tubing piping conforming to ASTM A106/A106M, Grade[B][C].

Ensure that the drain discharge is[capped][plugged]. Make the threaded closure assembly with tetrafluoroethylene tape.

2.2.2.2 Globe and Angle Valves 1100 kPa 150 psi

Provide valves rated 1100 kilopascal 150-psi wsp and ensure that the valves conform to ASME B16.34.

Provide flanged body end connections for all valves larger than 50 mm 2 inches, unless butt-welding ends are indicated. Use[screwed][socket] weld for sizes 50 mm 2 inches and under to suit specified piping system end connection and maintenance requirements. Provide valves with flange faces and a concentric serrated finish.

Provide a[union][gasketed-bolted] body-to-bonnet connections for valves 50 mm 2 inches and under; gasketed-bolted for valves larger than 50 mm 2 inches; and for valves DN10 3/8 inch and under, a screwed assembly. Ensure that an OS&Y bonnet is provided; for valves 10 mm 3/8 inch and under, use an inside screw bonnet.

Provide a[cast steel][forged carbon steel] body-and-bonnet assembly, with cast steel conforming to ASTM A216/A216M, Grade WCB, or forged carbon steel conforming to ASTM A105/A105M.

Ensure that the trim for valves larger than 50 mm 2 inches, and for all sizes of valves in bypass service, includes a hard-surfaced, solid plug disk and hard-surfaced seats. For plug material in valves 50 mm 2 inches and under, provide[as specified for valves larger than 50 mm 2 inches][in accordance with AISI 400 series corrosion-resistant steel hardened to at least 500 Brinell]. Ensure that a rising and backseating stem is provided.

Provide trim materials and hard-surface substrates[conforming to ASTM A182/A182M, Grade F6][of the manufacturer's standard metallurgical equivalents for the specified service].

Ensure that the hard-surfacing alloy conforms to AWS A5.13/A5.13M,[Class RNiCr-B][Class RCoCr-B].

Provide wire-reinforced packing, fiber braid impregnated with[30 percent tetrafluoroethylene][a corrosion-inhibiting lubricant specifically suitable for service with stem material provided].

Provide[cast iron][malleable iron][wrought steel] valve wheels.

****

NOTE: Note on the drawings all locations where integral drain valve is required. Integral drain valves are particularly useful in risers. Note in all cases where required, except where valve size is less than 50 mm 2 inches. In that case, provide an independent drain immediately above the valve. Note the pitch of horizontal lines.

****

Provide a [factory][field]-installed integral, drain-valve assembly. Factory drill the main valve boss. Weld the connection to the main valve body. Trim the drain valve with the manufacturer's standard hardened corrosion-resistant steel. Provide pressure tubing piping conforming to

ASTM A106/A106M, Grade[B][C]. [Cap] [Plug] the drain discharge. Make threaded closure assembly with tetrafluoroethylene tape.

2.2.2.3 Globe and Angle Valves 900 kPa 125 psi

Provide valves rated 900 kilopascal 125 psi (wsp) conforming to MSS SP-80, MSS SP-86,[globe][angle], [900] [1100] kilopascal [125] [150]-pound.

Provide flanged body end connections for all valves larger than 50 mm 2 inches and screwed end connections for sizes 50 mm 2 inches and under.

For valves in sizes 50 mm 2 inches and under in size, provide a union bonnet.

Ensure that the cast iron conforms to ASTM A126, Class B.

Provide a rising and backseating stem.

A composition seating surface disc construction may be substituted for a metal plug disc connection.

****
NOTE: Select the following paragraph for large pressure regulating stations.
****

[Provide 1100 kilopascal 150 psi pressure regulating station bypass valves.

****
NOTE: Select the following paragraph for miscellaneous high-pressure drop throttling.
****

][For plug material for throttling valves 50 mm 2 inches and under, provide AISI 400 series corrosion-resistant steel hardened to not less than 500 Brinell.

] Provide a braid packing impregnated with 30 percent tetrafluoroethylene.

Provide[cast iron][malleable iron][wrought steel] valve wheels.

****
NOTE: Note on the drawings all locations where an integral drain valve is required. Integral drain valves are particularly useful in risers. Note in all cases where required, except where the valve size is less than 50 mm 2 inches. In that case, provide an independent drain immediately above the valve. Note the pitch of horizontal lines.
****

Provide integral drain valves. Ensure that the main valve boss penetration is factory-finished and that the drain assembly is[factory][field]-installed. Provide a gate drain valve. Provide pressure tubing type piping conforming to ASTM A106/A106M, Grade[B][C]. Ensure that the drain discharge is[capped][plugged], and that the threaded closure assembly is made with tetrafluoroethylene tape.

2.2.3 Check Valves

****
NOTE: These valves are recommended for steam and condensate service.
****

2.2.3.1 Check Valves 2500 kPa 350 psi

Provide valves rated 2100 kilopascal 300 psi wsp and ensure that the valves conform to applicable portions of ASME B16.34.

Provide horizontal swing-check valves.

Provide flanged body end connections for all valves larger than 50 mm 2 inches unless butt-welding ends are specified. Use [screwed] [socket] weld connections for sizes 50 mm 2 inches and under to suit the specified piping system end connection and maintenance requirements. Provide valves with flange faces and a concentric serrated finish.

Provide a[union][gasketed-bolted] body to cover the connection.

Provide a[cast steel][forged carbon steel] body-and-bonnet assembly, with[cast steel conforming to ASTM A216/A216M, Grade WCB][forged carbon steel conforming to ASTM A105/A105M].

Ensure that the trim materials, including the hinge pin, are the manufacturer's standard corrosion-resistant alloys for the specified service.

2.2.3.2 Check Valves 900 kPa 125 psi

Provide standard horizontal swing valves rated 900 kilopascal 125 psi wsp, conforming to MSS SP-80, MSS SP-86, swing check, 900 kilopascal 125-pound.

Provide flanged body end connections for all valves larger than 50 mm 2 inches. Provide screwed connections for valves in sizes 50 mm 2 inches and under.

Provide a gasketed-bolted body to cover the connection;[cast iron, conforming to ASTM A126, Class B][Class 1[Class 1, at 178 degrees C; 1379 kilopascal 125-psig, wsp at 353 degrees F; 200 psig water, oil and gas (wog), nonshock] valves conforming to MSS SP-70] in sizes larger than 50 mm 2 inches. Ensure that the flanges conform to ASME B16.1.

Provide a corrosion-resistant[steel][bronze][brass] swing check pin. Ensure the swing check angle of closure is the manufacturer's standard, unless a specific angle is indicated.

Provide a[regrindable metal][renewable composition] valve disk.

2.2.3.3 Manual Radiator Valves

****
NOTE: The following paragraph applies to steam and hot water systems.
****

Ensure that the control heating valves that use a medium heating element

are the packless type, conforming to CID A-A-50457, Type II, Style D metallic diaphragm seal.

2.2.4 Cone-Plug Balancing Valve (CPBV)

Provide cone-plug balancing valves in sizes through DN32 11/4 inches with thread end, conforming to ASME B1.20.1 and ASME B1.20.2M; rated for service at not less than 1207 kilopascal at 121 degrees C 175 psi at 250 degrees F. Provide valve body and components that are[ASTM B61 bronze][the manufacturer's brass materials of equal strength]. Provide a swivel contoured cone valve plug that does not rattle or make noise in service at any balancing position. Ensure that the valve has high-temperature, service-rated packing, with a bushing in the bottom of the gland and gland adjustment. Fit valves with a memory device that permits a valve that is set at a balance point to be opened or closed, but not opened beyond the balance point. Provide a nonrising stem valve. Where used for combination shutoff and balancing service, furnish a valve with an insulating composition handle.

2.2.5 Eccentric Plug Valves (EPV)

****

NOTE: Review the service temperature range of dual-temperature systems prior to making a selection and restrict operation to specified temperatures and materials to ensure a long service life for the elastomer.

****

[Provide eccentric plug valves in sizes 50 mm 2 inches and smaller, constructed of the manufacturer's standard [brass] [bronze] materials conforming to[ASTM B61][ASTM B62]. Rate valves for service at 1207 kilopascal 175 psi maximum nonshock pressure at 121 degrees C 250 degrees F. Provide a valve body with screwed ends. Coat eccentric plug surfaces in contact with flow with a 60 to 70 Shore A durometer hardness elastomer, resistant to treated water. Fit valves used for combination shutoff and balancing service with a memory device or mechanism that permits a valve that is set at a balance point to be operated to the closed position.

][Provide reopening, limited to eccentric plug valves in sizes DN65 2 1/2 inches and larger, constructed of Type 2 nickel-alloy iron conforming to ASTM A436. Rate valves for service at 1207 kilopascal 175 psi maximum nonshock pressure at 121 degrees C 250 degrees F. Provide a valve body with screwed ends. Coat the eccentric plug surfaces with a 60 to 70 Shore A durometer hardness elastomer, resistant to treated water. Fit valves that are used for a combination shutoff and balancing service with a memory device. Provide a memory device or mechanism that permits a valve that is set at a balance point to be operated to the closed position, but with reopening limited to the balance point. Fit valves up to 150 mm 6 inches ips with a removable lever operator.
]

****

NOTE: Normally delete the following paragraphs. Limit to 125 mm 5 inch valves. The cross-sectional area of the valve bore, when open, equals the pipe inlet area.

****

[Fit valves 150 mm 6 inches and larger, with a totally enclosed,

flood-lubricated, worm-gear drive; with an operating torque not exceeding 68 newton meter 50 foot-pounds.

]PART 3 EXECUTION

3.1 INSTALLATION

Install valves in accordance with the manufacturer's recommendations, approved installation drawings, and in accordance with the applicable requirements of Section 23 05 15 COMMON PIPING FOR HVAC.

-- End of Section --