Preparing Activity: NASA Superseding
UFGS-23 09 13.34 40 (February 2011)
UFGS-23 09 13.34 (November 2010)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated July 2023
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02/17

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SECTION 23 09 13.34 40

CONTROL VALVES, SELF-CONTAINED
02/17

NOTE: This guide specification covers the requirements for self-contained control and relief valves.

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

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 B16.1	(2020) Gray Iron Pipe Flanges and Flanged Fittings Classes 25, 125, and 250
ASME BPVC SEC VI	(2017) BPVC Section VI-Recommended Rules for the Care and Operation of Heating Boilers

AMERICAN SOCIETY OF SANITARY ENGINEERING (ASSE)

ASSE 1003	(2020) Performance Requirements for Water Pressure Reducing Valves for Domestic Water Distribution Systems - (ANSI approved 2010)

ASTM INTERNATIONAL (ASTM)

ASTM A48/A48M	(2003; R 2021) Standard Specification for Gray Iron Castings
ASTM A126	(2004; R 2019) Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings
ASTM A463/A463M	(2022) Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process
ASTM B61	(2015; R 2021) Standard Specification for Steam or Valve Bronze Castings

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 4126-1	(2013; Amd 1 2016) Safety Devices for Protection Against Excessive Pressure - Part 1: Safety Valves
ISO 5209	(1977) General Purpose Industrial Valves - Marking
ISO 5752	(2021) Metal Valves for Use in Flanged Pipe Systems - Face to Face and Center to Face Dimensions
ISO 7005-2	(1988) Metallic Flanges Part 2: Cast Iron Flanges

1.2 ADMINISTRATIVE REQUIREMENTS

****

NOTE: If Section 23 30 00 HVAC AIR DISTRIBUTION is not included in the project specification, applicable requirements therefrom should be inserted and the following paragraph deleted.

****

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

Submit fabrication drawings for self-contained control and relief valves, including part numbers and exploded views.

Submit a list of product installations for self-contained control and relief valves, identifying a minimum of five installed units, similar to those proposed for use, that have been in successful service for a minimum period of 5 years.

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

Self-Contained Temperature Control Valves; G[, [____]]

Self-Contained Temperature-Regulator Valves; G[, [____]]

Rate-of-Flow Controller; G[, [____]]

Nonmodulating Float Valve; G[, [____]]

Water Pressure Regulating Valve; G[, [____]]

Water Pressure Relief Valve; G[, [____]]

Pilot-Operated Pressure Relief Valve; G[, [____]]

Relief Valves for Electric Water Heaters; G[, [____]]

Sample Warranty; G[, [____]]

SD-07 Certificates

List of Product Installations; G[, [____]]

Certificates of Conformance; G[, [____]]

Manufacturer's Warranty; G[, [____]]

SD-06 Test Reports

Test Reports; G[, [____]]

1.4 QUALITY ASSURANCE

Submit certificates of conformance for the following items, showing conformance with the referenced standards contained in this section:

a. Self-Contained Temperature Control Valves

b. Self-Contained Temperature Regulator Valves

c. Rate-of-Flow Controller

d. Nonmodulating Float Valve

e. Water Pressure Regulating Valve

f. Water Pressure Relief Valve

g. Pilot-Operated Pressure Relief Valve

h. Relief Valves for Electric Water Heaters

Submit a copy of the manufacturer's sample warranty to the Contracting Officer for review.

PART 2 PRODUCTS

2.1 SELF-CONTAINED TEMPERATURE-CONTROL VALVES

****
NOTE: Select or delete the heading and the following paragraphs as applicable to the project.

Type I pressure limits: 175 kilopascal 25 pounds per square inch (psi), gage, 99 degrees C 210 degrees F water.

Type II pressure limits: 550 kilopascal, 99 degrees C 80 psig, 210 degrees F water.

Select, revise, delete or supplement the following to suit project conditions.
****

Provide self-contained temperature-control valves that meet the following requirements:

****
NOTE: Select one or both of next two paragraphs, subject to the project scope.
****

[a. Type I, Class II (integral temperature-sensing units for very hot water).

][b. Type II, Class 2, Style A (remote temperature-sensing units for very hot water with a single temperature-sensing control element).

] Mount the set-point adjustment on the cabinet of the convector; ensure that the control knob is accessible on the cabinet surface.

Wall-mount the set-point adjustment and thermostat for finned-tube radiation. Provide nickel-plated brass thermostat surfaces.

Provide armored capillary tubing, with the remote element at least 18 inches long and contained within a guard.

Provide renewable valve disks.

[2.2 SELF-CONTAINED TEMPERATURE-REGULATOR VALVES

Provide direct-operated, self-contained valves, with an[ASTM B61, (bronze)][ASTM A126 (cast iron)] body rated not less than 862 kilopascal

125 pounds per square inch (psi) of saturated working steam pressure. Provide with screwed body end connections. Ensure that the trim is corrosion-resistant AISI Type 300 Series steel. Provide valves that have a hardened replaceable seat and plug, or faced with a cobalt-chromium-tungsten alloy to produce a surface with resistance to impact and wire-drawing and with a Brinell hardness of at least 450. Fit packed steam valves with tetrafluoroethylene packing, and spring-load and self-adjust. Ensure that the valves are single-seated, suitable for dead-end service, and fail-safe. Mount a remote Class I or Class III filled-bulb element in a nonferrous separable socket. Ensure that valves maintain the set-point temperature, plus or minus 15 degrees C 5 degrees F, with the set point at or near the midpoint of the adjustable element range.

][2.3 RATE-OF-FLOW CONTROLLER

****

NOTE: Select for service to maintain constant flow-rate, regardless of changing line pressure. Provide flow and size data.

****

Provide a hydraulically operated, pilot-controlled diaphragm globe valve for a rate-of-flow controller, with the pilot control configured to actuate by differential pressure produced across an orifice installed at the inlet. Ensure that the flow rate is adjusted by varying the spring-loading on the pilot. Provide a valve with cast-iron valve body conforming to ASTM A48/A48M, with 862 kilopascal 125-pound ASME B16.1, and ISO 7005-2 flanges. Ensure that the valve trim is the manufacturer's standard bronze or AISI 18-8 corrosion-resistant steel, that the orifice plate is made of AISI Type 303 corrosion-resistant steel, and the diaphragm and seal are Buna-N. Ensure that the maximum-service-pressure rating is not less than 1207 kilopascal at 82 degrees C 175 psi at 180 degrees F.

][2.4 NONMODULATING FLOAT VALVE

****

NOTE: Use with cooling towers.

****

Provide a nonmodulating float valve that is pilot-controlled, diaphragm-actuated, spring-loaded, single-seated, and hydraulically operated. Mount the pilot valve on the main valve or remotely mount the pilot valve within the cooling tower basin. Ensure that the main valve body is cast iron conforming to ASTM A48/A48M with screwed ends for sizes smaller than DN50 2 inches iron pipe size (ips) and flanges conforming to ASME B16.1 for sizes DN50 2 inch ips and larger, with a brass or bronze pilot valve body, with main and pilot valve trim, including linkage and float, made of the manufacturer's standard bronze-copper or AISI Type 300 series corrosion-resistant steel. Ensure that diaphragm materials and seals are Buna-N, and that this valve has a maximum-service-pressure rating is not less than 1207 kilopascal at 82 degrees C 175 psi at 180 degrees F. Ensure that the valve operation is the nonslam type.

][2.5 WATER PRESSURE-REGULATING VALVE

Provide a direct-acting pressure-regulating valve conforming to and ISO 5752 (ASSE 1003) ASSE 1003.

Ensure that the pressure-regulating valve does not stick or allow pressure to build up on the low side. Set the valve to maintain a terminal pressure of approximately 35 kilopascal 5 psi in excess of the static head on the system and operate within a 9 Newtons 2-pound maximum variation regardless of initial pressure fluctuation, and without objectionable noise.

][2.6 WATER PRESSURE-RELIEF VALVE

Construct, label, and install the pressure-relief valve in accordance with ASME BPVC SEC VI ISO 5209 and ISO 4126-1. Ensure that the relieving capacity is as specified by the referenced publication, with valves of nonferrous construction, complete with a test lever.

][2.7 PILOT-OPERATED PRESSURE-RELIEF VALVE

****
NOTE: Select for pump-discharge pressure control or for surge protection downstream of check.
****

Provide a pilot-operated pressure-relief valve that is hydraulically operated and has pilot-controlled modulating, with an adjustable set point over the indicated range. Provide a cast-iron valve body conforming to ASTM A48/A48M, with 862 kilopascal 125 psi ASME B16.1, and ISO 7005-2 flanges. Include the with manufacturer's standard brass, bronze, or corrosion-resistant steel valve trim. Provide pilot control with AISI Type 303 or 304 corrosion-resistant steel trim with Buna-N diaphragm and seal material. Ensure that this valve has a maximum-service-pressure rating of at least 1207 kilopascal at 82 degrees C 175 psi at 180 degrees F.

][2.8 RELIEF VALVES FOR ELECTRIC WATER HEATERS

Provide temperature- and pressure-relief valves conforming to ASTM A463/A463M. Install Type I (combination pressure- and temperature-relief) valves when the heat input is less than 30 kilowatts 100,000 Btu per hour and when the storage is less than 450 liter 120 gallons. If either or both of the specified conditions will be reached or exceeded, install Type II (temperature relief, water-rated) or Type III (temperature relief, steam-rated) valves. Install vacuum-relief valves on each cold-water branch connection to an electric water heater at an elevation above the top of the heater. Design vacuum relief valves to prevent damage to the water heater from a reverse flow vacuum.

]PART 3 EXECUTION

3.1 INSTALLATION

Submit installation drawings for self-contained control and relief valves. Install valves as specified in accordance with the manufacturer's recommendations and Section 23 05 15 COMMON PIPING FOR HVAC.

[3.2 FIELD QUALITY CONTROL

3.2.1 Test Reports

After the installation has been completed, test the system components and submit [_____] copies of the test reports to the Contracting Officer. Remove and replace defective components at no cost to the Government.

Retest components and submit reports to the Contracting Officer.

]3.3 CLOSEOUT ACTIVITIES

Submit [_____] copies of the manufacturer's warranty, to the Contracting Officer before project closeout. Ensure that the warranty has been signed by the Authority Having Jurisdiction (AHJ) and is assigned to the Government.

-- End of Section --