



Standard Specification for Pressure-Reducing Valves for Water Systems, Shipboard¹

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This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This specification covers self-contained, globe style, pressure-reducing valves for use in water systems of shipboard installations. These valves are limited to discharge pressure settings of 200 psig (1379 kPa) and below.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 The following precautionary caveat pertains only to the tests portion, Section 8, of this specification: *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

A125 Specification for Steel Springs, Helical, Heat-Treated
A193/A193M Specification for Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications

A194/A194M Specification for Carbon Steel, Alloy Steel, and Stainless Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both

A231/A231M Specification for Chromium-Vanadium Alloy Steel Spring Wire

A276 Specification for Stainless Steel Bars and Shapes

A313/A313M Specification for Stainless Steel Spring Wire

A689 Specification for Carbon and Alloy Steel Bars for Springs

B21/B21M Specification for Naval Brass Rod, Bar, and Shapes

B26/B26M Specification for Aluminum-Alloy Sand Castings

B61 Specification for Steam or Valve Bronze Castings

B62 Specification for Composition Bronze or Ounce Metal Castings

B148 Specification for Aluminum-Bronze Sand Castings

B150/B150M Specification for Aluminum Bronze Rod, Bar, and Shapes

B637 Specification for Precipitation-Hardening and Cold Worked Nickel Alloy Bars, Forgings, and Forging Stock for Moderate or High Temperature Service

B689 Specification for Electroplated Engineering Nickel Coatings

F467 Specification for Nonferrous Nuts for General Use

F468 Specification for Nonferrous Bolts, Hex Cap Screws, Socket Head Cap Screws, and Studs for General Use

F593 Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

F594 Specification for Stainless Steel Nuts

2.2 ASME Standards:³

ASME B1.1 Unified Inch Screw Threads, UN and UNR Thread Form

ASME B1.12 Class 5 Interference-Fit Thread

¹ This specification is under the jurisdiction of ASTM Committee F25 on Ships and Marine Technology and is the direct responsibility of Subcommittee F25.11 on Machinery and Piping Systems.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American Society of Mechanical Engineers (ASME), ASME International Headquarters, Two Park Ave., New York, NY 10016-5990, <http://www.asme.org>.

2.3 ISA Standards:⁴

ISA S75.01 Flow Equations for Sizing Control Valves

ISA S75.02 Control Valve Capacity Test Procedure

2.4 Federal Specifications:⁵

QQ-B-637 Brass, Naval: Rod, Wire, Shapes, Forgings, and Flat Products with Finished Edges (Bar, Flat Wire, and Strip)

QQ-C-390 Copper Alloy Casting (Including Cast Bar)

QQ-C-465 Copper-Aluminum Alloys (Aluminum Bronze) (Copper Alloy Numbers 606, 6014, 630, 632M, and 642); Rod, Flat Products with Finished Edges (Flat Wire, Strip, and Bar) Shapes, and Forgings

QQ-N-281 Nickel-Copper Alloy Bar, Rod, Plate, Sheet, Strip, Wire, Forgings, and Structural and Special Shaped Sections

QQ-N-286 Nickel-Copper-Aluminum Alloy, Wrought (UNS N05500)

QQ-N-288 Nickel-Copper Alloy and Nickel-Copper-Silicon Alloy, Castings

QQ-S-763 Steel Bars, Wire, Shapes, and Forgings, Corrosion Resisting

QQ-S-766 Steel Corrosion Resisting Plate, Sheet and Strip

QQ-W-390 Wire, Nickel-Chromium-Iron Alloy

TT-P-645 Primer Paint, Zinc Chromate, Alkyd Type

2.5 Military Standards and Specifications:⁵

MIL-V-3 Valves, Fittings, and Flanges (Except for Systems Indicated Herein), Packaging of

MIL-S-901 Shock Tests, H.I. (High Impact), Shipboard Machinery, Equipment and Systems, Requirements for

MIL-F-1183 Fittings, Pipe, Cast Bronze, Silver-Brazing, General Specification for

DOD-P-15328 Primer (Wash), Pretreatment (Formula No. 117 for Metals) (Metric)

MIL-F-20042 Flanges, Pipe and Bulkhead, Bronze (Silver Brazing)

MIL-C-20159 Copper-Nickel Alloy Casting (UNS No. C96200 and C96400)

MIL-F-24227 Fittings and Flanges, Cast Bronze, Silver Brazing Suitable for Ultrasonic Inspection

MIL-B-24480 Bronze, Nickel-Aluminum (UNS No. C95800) Castings for Seawater Service

MIL-S-81733 Sealing and Coating Compound, Corrosion Inhibitive

MIL-STD-167-1 Mechanical Vibrations of Shipboard Equipment (Type I—Environmental, and Type II—Internally Excited)

MIL-STD-248 Welding and Brazing Procedure and Performance Qualification

MIL-STD-278 Welding and Casting Standard

MIL-STD-798 Non-destructive Testing, Welding, Quality Control, Material Control and Identification, and Hi-shock Test Requirements for Piping System Components for Naval Shipboard Use

2.6 Other Publications:⁵

Naval Sea Systems Command (NAVSEA)

2.7 Drawings:⁵

803-1385946 Union Bronze, Silver Brazing WOG for UT Inspection

803-1385947 Flanges, Bronze, 700 PSI WOG for UT Inspection

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *accuracy of regulation, n*—the amount by which the downstream pressure may vary when the valve is set at any pressure within the required set pressure limit and is subjected to any combination of inlet pressure, flow demand, and ambient temperature variations within the specified limits.

3.1.2 *design pressure and temperature, n*—the maximum pressure and temperature the valve should be subjected to under any condition; these are the pressure and temperature upon which the strength of the pressure-containing envelope is based.

3.1.3 *hydrostatic proof test pressure, n*—the maximum test pressure that the valve is required to withstand without damage; valve operation is not required during application of this test pressure, but the valve must meet all performance requirements after the pressure has been removed.

3.1.4 *lockup pressure, n*—the outlet pressure delivered by a pressure-reducing valve when the flow is reduced to zero; lockup pressure is always greater than set pressure, and in actual practice it may vary with the specific valve design, tolerances, method of sensing downstream pressure, and piping configurations.

3.1.5 *nominal pressure, n*—the approximate maximum pressure to which the valve will be subjected in service under normal conditions.

3.1.6 *set pressure, n*—the downstream pressure that the valve is set to maintain under a given set of operating conditions (that is, inlet pressure and flow); the valve should ideally be set at downstream pressure approximately equal to the midpoint of the set pressure limits (defined in 3.1.7).

3.1.7 *set pressure limits (set pressure adjustable range), n*—the range of set pressure over which the valve can be adjusted while meeting the specified performance requirements.

4. Classification

4.1 Valves shall be of the following types and pressure ratings, as specified (see Section 5 and 6.1.21).

4.1.1 *Type I*—Pressurized spring chamber, and

4.1.2 *Type II*—Unpressurized spring chamber.

4.2 *Pressure Ratings*—Valves shall have nominal inlet pressure ratings of 150 psig or 250 psig (1034 kPa or 1724 kPa), or as specified (see 6.1.21).

5. Ordering Information

5.1 Ordering documentation for valves in accordance with this specification shall include the following information, as required, to describe the equipment adequately.

⁴ Available from International Society of Automation (ISA), 67 T.W. Alexander Drive, PO Box 12277, Research Triangle Park, NC 27709, <https://www.isa.org>.

⁵ Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.