

INCH-POUND

MIL-V-24384B(SH)

17 February 1988

SUPERSEDING

MIL-V-24384A(SHIPS)

26 April 1971

(See 6.7)

MILITARY SPECIFICATION

VALVES, PRESSURE REGULATING, FOR LOW
PRESSURE AIR OR NITROGEN SYSTEMS

This specification is approved for use within the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers self-contained pressure regulating valves with a nominal pressure rating of 150 pounds per square inch (lb/in²) gauge for service in low pressure air or nitrogen systems.

1.2 Classification. Pressure regulating valves shall be of the following types, classes, and designs, as specified (see 6.2.1):

Type I - Pressure reducing
Type II - Back pressure regulating
Type III - Priority

Class A - Spring loaded
Class B - Gas dome loaded
Class C - Internal pilot operated

Design A - Unbalanced
Design B - Balanced

1.2.1 Selection. Unless otherwise specified (see 6.2.1) the contractor shall select the class and design of valve best suited to meet the service conditions specified (see 6.2.1). The most simple construction suitable for each application shall be chosen.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

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2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

FEDERAL

- 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).

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- 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.

STANDARDS

FEDERAL

- FED-STD-H28 - Screw-Thread Standards for Federal Services.

MILITARY

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

2.2 Other publications. The following document forms a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

UNIFORM CLASSIFICATION COMMITTEE AGENT

Uniform Freight Classification Ratings, Rules and Regulations

(Application for copies should be addressed to the Uniform Classification Committee Agent, Tariff Publication Officer, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

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(Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 First article. When specified in the contract or purchase order, a sample shall be subjected to first article inspection (see 4.3 and 6.3).

3.2 Materials. Materials shall be as specified in table I. Materials shall be suitable for the intended pressure and shall be selected to prevent galling, seizing, or excessive wear between parts. This specification is not intended to be restrictive, providing proposed alternate materials will provide satisfactory service. Naval Sea Systems Command (NAVSEA) approval is required for the use of any alternate material.

TABLE I. List of materials.

Name of parts	Material
Body, gas dome or spring housing, and bottom cap	Valve bronze, nickel-aluminum bronze, copper-nickel, CRES
Springs	Phosphor bronze, CRES, cadmium plated steel, nickel-copper-iron alloy, QQ-N-281 or QQ-N-286
Valve poppet, seat ring, stem, guides, and other internal trim	CRES, bronze, nickel-aluminum-bronze, QQ-N-281 or QQ-N-286

3.2.1 Recovered materials. Unless otherwise specified herein, all equipment, material, and articles incorporated in the products covered by this specification shall be new and may be fabricated using materials produced from recovered materials to the maximum extent practicable without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specifically specified.

3.3 Construction.

3.3.1 General. Internal trim shall be readily replaceable without requiring removal of the valve body from the line. These valves will be operated, maintained, and repaired on board Navy ships and attention is directed to the fact

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that these valves will often operate under unfavorable contamination conditions, will operate for long periods of time unattended, and that maintenance personnel may not be experienced mechanics. Therefore, emphasis shall be placed on simplicity, maintainability, ruggedness, and reliability, as defined in 3.3.1.1 through 3.3.1.4.

3.3.1.1 Simplicity. Valves shall be constructed with the least separate parts and least dynamic seals consistent with satisfactory performance. The valve shall require no adjustments during or after assembly, other than the set point adjustment.

3.3.1.2 Maintainability. Internal parts shall be constructed to permit easy disassembly and reassembly with standard tools and to prevent, as far as practical, the incorrect reassembly of parts. Positioning and alignment of all parts in assembly shall employ positive means so that correct reassembly is repeatedly assured. In no case shall parts for a given valve be physically interchangeable or reversible unless such parts are also interchangeable or reversible with regard to function, performance and strength.

3.3.1.3 Ruggedness. To the maximum extent practical, valves shall be constructed to tolerate and not be easily subject to damage, malfunction, or leakage resulting from foreign particle and other line media contamination or from mishandling. Therefore, valves shall not incorporate or rely upon excessively fine clearances or finishes. Valves shall tolerate particulate contamination up to 40 micrometers in size.

3.3.1.4 Reliability. Valves shall operate satisfactorily for extended periods of time with minimum need for maintenance, lubrication, or adjustment, when subjected to the conditions normally associated with shipboard service. Valves shall not require maintenance or lubrication at intervals shorter than 1 year, under continuous use on shipboard applications.

3.3.2 Pressure envelope. The design and test pressures for the pressure containing envelope (body, gas dome or spring housing, and bottom cap) shall be as follows:

- (a) Nominal pressure rating - 150 lb/in² gauge.
- (b) Design temperature - 165 degrees Fahrenheit (°F).
- (c) Proof pressure - 225 lb/in² gauge.
- (d) Burst pressure - 450 lb/in² gauge.

3.3.3 Internal trim. The poppet or plug guiding surfaces (bushings and posts) shall have the proper hardness, finish, concentricity, parallelism, clearances, length and rigidity to prevent binding or seizing and to ensure proper seating under all operating conditions. These alignment requirements shall be maintained with interchangeable parts and under any tolerance stack-up condition. A nonmetallic seating feature shall be incorporated in either the poppet or seat and shall be readily replaceable on all sizes. The finish on the guide posts and bushings shall be 32 roughness height rating (RHR) or better.

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3.3.4 Body. Valves shall be of basic globe configuration with inline inlet and outlet ports. Pressure lines, including the reduced pressure sensing line, gas dome loading line, and poppet balance line, where applicable, shall be internally ported in the body. The construction shall be such as to prevent direct high velocity impingement of the flow issuing from the throttling orifice onto the sensing element. The bonnet or spring housing and bottom cap shall be attached to the body with bolted flanges or threaded connection. Bearing surfaces of nuts and bolts and their respective mating surfaces on the valve shall be finished machined if not cast or forged smooth and true.

3.3.5 Interchangeability. All parts having the same manufacturer's part number shall be directly interchangeable with each other with respect to installation and performance without requiring selection or fitting.

3.3.6 Springs. Springs shall be constructed so that they will not be compressed solid during any operation of the valve. Spring ends shall be squared and ground. When removed from the valve and compressed solid, the spring shall not exhibit a permanent set exceeding 0.010 inch per inch of spring length, measured 10 minutes after release of the spring.

3.3.7 Threads. Threads shall conform to FED-STD-H28. Where necessary, provisions shall be incorporated to prevent the accidental loosening of threaded parts. Pipe threads shall not be used. The construction shall be such that standard wrenches can be used on all external bolting.

3.3.8 Set pressure adjustment. Means shall be provided for adjusting the set pressure through a range of at least 75 to 125 percent of the specified set pressure (see 6.2.1), with the valve under pressure. The adjusting or loading device shall be safeguarded against accidental change in the set pressure.

3.3.9 End connections. Inlet and outlet connections shall be union end in accordance with MIL-F-1183. Union nuts and tail pieces shall be furnished with the valve.

3.4 Performance requirements. Valves shall operate smoothly without instability and shall meet the requirements of 3.4.1 through 3.4.6.

3.4.1 Accuracy of regulation (see 6.4.2(b)), type I valves.

3.4.1.1 Flow-droop. Unless otherwise specified in the contract or order (see 6.2.1), the valve shall maintain the delivered pressure within the limits of plus or minus 5 percent or plus or minus 2 lb/in², whichever is greater, when the flow demand is varied between lock-up and the full flow rating of the valve and with a constant inlet pressure of 150 lb/in² gauge.

3.4.1.2 Set pressure shift. The ratio of set pressure shift to inlet pressure shift shall not exceed 1:20 for design A valves and 1:100 for design B valves.

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3.4.1.3 Seat tightness. With 150 lb/in² gauge at the inlet and the downstream pressure at lock-up (see 6.4.2(d)), leakage from the inlet to outlet portion of the valve shall not exceed 15 standard cubic inches per hour (in³/hr) per inch of seat diameter. This requirement may be checked by measuring the pressure buildup in a known volume over a given period of time. The volume and time for this test shall be chosen so that a pressure buildup of not more than 1 or 2 percent is required to indicate excessive leakage.

3.4.2 Performance - type II valves.

3.4.2.1 Accumulation-blowdown. The valve shall pass rated flow when the inlet pressure is increased to the accumulation pressure and shall reseal tightly (no leakage) when the inlet pressure is reduced to the blowdown (reseal) pressure. Unless otherwise specified in the contract or order (see 6.2.1), the total band between the accumulation and blowdown pressure shall not exceed 10 percent of the set pressure or 4 lb/in², whichever is greater. Type II valves shall respond essentially to the inlet pressure only and outlet pressures up to 85 percent (or higher when so specified) of the inlet pressure shall have no effect on the ability of the valve to strobe and remain fully open in response to inlet conditions.

3.4.2.2 Set pressure shift. The ratio of set pressure shift to outlet pressure shift shall not exceed 1:20 for design A valves and 1:100 for design B valves.

3.4.2.3 Seat tightness. With the inlet pressure reduced to the reseal (blowdown) pressure, there shall be no visible leakage (using bubble fluid or submerging the outlet, or a line from the outlet under water) from the inlet to outlet when checked over a 2-minute period.

3.4.3 Performance - type III valves.

3.4.3.1 Range of regulation. The band between set pressure and full open pressure shall not exceed 15 lb/in². At any inlet pressure at or below the set pressure, the valve shall always be completely shutoff. At any inlet pressure at or above the full open pressure, the valve shall always be fully open.

3.4.3.2 Capacity rating. The valve shall be sized so that when fully open, (that is, with an inlet pressure at or above the full open pressure) it shall pass rated flow (that is, the required system flow) with a pressure drop across the valve not exceeding 5 lb/in². For sizing purposes, and unless otherwise specified in the contract or order (see 6.2.1), the inlet pressure for this condition shall be taken as 150 lb/in² gauge. On this basis, the permissible pressure drop at lower inlet pressures (but still at or above the full open pressure) will be greater and can be determined by the following equation:

$$\text{Permissible pressure drop (lb/in}^2\text{)} = p - (p^2 - 1625)^{1/2}$$

Where: P = inlet pressure lb/in² absolute

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Example: Assume set pressure equals 80 lb/in² gauge and flow test is conducted at 95 lb/in² gauge inlet instead of 150 lb/in² gauge inlet

Permissible pressure drop (lb/in² = 110 - (110² - 1625)^{1/2} = 7.7 lb/in²

3.4.3.3 Seat tightness. When the inlet pressure is at or below the set pressure, there shall be no visible leakage (using bubble fluid or submerging the outlet, or a line from the outlet, under water) from the inlet to the outlet when checked over a 2-minute period.

3.4.4 Range of adjustment. Valves shall meet all performance requirements when set at any point within the required range of set pressure adjustment (see 3.3.8).

3.4.5 External leakage. There shall be no visible external leakage, over a 5-minute period, using either bubble fluid or submerging the valve in water.

3.4.6 Ambient conditions. The valve shall operate satisfactorily and meet the performance requirements specified when subjected to environmental vibration, as defined by type I of MIL-STD-167-1, and the varying ambient pressure and temperature conditions specified (see 6.2.1).

3.4.7 Mechanical shock. Valves shall meet the mechanical shock requirements defined by grade A, class I of MIL-S-901.

3.5 Marking.

3.5.1 Body markings. Valve bodies shall have the pressure rating, manufacturer's name or trademark, and flow arrow or "inlet" and "outlet" cast, forged or stamped with round bottom dies on them.

3.5.2 Identification plates. An identification plate of corrosion-resisting steel, brass or anodized aluminum shall be securely attached to the valve and shall list the following data or a space therefore:

- (a) Manufacturer's name or trademark.
- (b) MIL-V-24384 and type, class and design.
- (c) Capacity rating of valve in standard cubic feet per minute (ft³/min) at a given set of operating conditions.
- (d) Nominal inlet pressure rating.
- (e) Adjustable range.
- (f) Manufacturer's drawing number.
- (g) Manufacturer's model and part number.
- (h) Applicable manual number.
- (i) Space for 9-digit component identification (CID) number.

3.6 Drawings. When specified in the contract or order, drawings shall be prepared (see 6.2.2).

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4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- (a) First article inspection (see 4.3).
- (b) Quality conformance inspection (see 4.4).

4.3 First article examination and tests. The first valve of the same size, type, class, design, setting, and capacity furnished under a contract or order shall undergo first article examination and tests as outlined in table II. Acceptance criteria shall be as given in table II.

TABLE II. First article examination and tests.

Examination and tests	Test conditions	Acceptance criteria
Visual examination	-----	Complete conformance to specification and approved drawings
Proof pressure test	Water, air, or nitrogen at 225 lb/in ² gauge applied to valve inlet	No external leakage, permanent distortion, or structural failure
External leakage test	Air or nitrogen at 150 lb/in ² gauge applied to inlet	As specified in 3.4.5

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TABLE II. First article examination and tests. - Continued

Examination and tests	Test conditions	Acceptance criteria
H.I. shock test <u>1/</u>	Grade A, class I of MIL-S-901. Valve pressurized during test.	No structural damage or degradation to performance capability.
Vibration test <u>1/</u>	Type I of MIL-STD-167-1	No resonant frequency 0-33, hertz (Hz). No structural damage or degradation of performance.
Accuracy of regulation tests - type I <u>2/</u>		
Flow-droop test	Constant 150 lb/in ² gauge inlet pressure. Vary flow from lock-up to the maximum flow rating of the valve being tested. Conduct at both extremes of set pressure range.	As specified in 3.4.1.1
Set pressure shift	Conduct above flow-droop test with a constant 100 lb/in ² gauge inlet pressure.	Shift in flow-droop curve caused by 50 lb/in ² gauge change in inlet pressure shall not exceed that permitted by 3.4.1.2
Seat tightness test	150 lb/in ² gauge inlet pressure. Downstream system dead ended.	As specified in 3.4.1.3
Performance tests - type II <u>2/</u>		
Accumulation-blowdown test	Inlet pressure increased until valve passes rated flow. Inlet pressure decreased until valve shuts off flow.	Accumulation and blowdown points shall be within band permitted by 3.4.2.1
Set pressure shift	Conduct above accumulation blow-down test with a different downstream pressure than used above.	Shift in accumulation - blow-down curve caused by change in outlet pressure shall not exceed that permitted by 3.4.2.2
Seat tightness test	Check for leakage over a 2-minute period with an inlet pressure equal to the minimum blowdown pressure permitted.	As specified in 3.4.2.3

See footnotes at end of table.

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TABLE II. First article examination and tests. - Continued

Examination and tests	Test conditions	Acceptance criteria
Performance tests - type III		
Flow, regulation, and seat tightness test	<p>Measure pressure drop across valve with 150 lb/in² gauge inlet pressure and a flow through the valve equal to the required rating.</p> <p>Reduce inlet pressure to 15 lb/in² over set pressure and measure flow and pressure drop to verify that valve is still full open.</p> <p>Reduce inlet pressure to 15 lb/in² to the set pressure and check for leakage through the valve.</p>	<p>Pressure drop not to exceed 5 lb/in²</p> <p>Valve to pass rated flow with a pressure drop not to exceed a value calculated in accordance with 3.4.3.2</p> <p>As specified in 3.4.3.3</p>

- 1/ Shock and vibration tests shall be required only when specified (see 6.2.1). Tests shall not be required if the valve has been previously approved for shock and vibration.
- 2/ The flow-droop and set pressure shift tests for type I valves and the accumulation-blowdown and set pressure shift tests for type II valve may be waived provided the contractor has data for the valve proposed which can be extrapolated to the intended application and which is based on actual test results.

4.4 Quality conformance inspection. All valves shall be subjected to quality conformance inspection. This shall consist of the visual examination, proof pressure test, seat tightness and external leakage tests outlined in table II. Any discrepancies or failures shall be corrected prior to acceptance.

4.5 Inspection of packaging. Sample packages and packs, and the inspection of the preservation-packaging, packing and marking for shipment and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

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5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition. For the extent of applicability of the packaging requirements or referenced documents listed in section 2, see 6.5.)

5.1 Domestic shipment and early equipment installation.5.1.1 Valves.

5.1.1.1 Preservation and packaging. Preservation and packaging, which may be the contractor's commercial practice, shall afford adequate protection against corrosion, deterioration and physical damage during shipment from the supply source to the using activity and until early installation.

5.1.1.2 Packing. Packing shall be accomplished in a manner which will insure acceptance by common carrier at the lowest rate and will afford protection against physical or mechanical damage during direct shipment from the supply source to the using activity for early installation. The shipping containers or method of packing shall conform to the Uniform Freight Classification Rules or other carrier regulations as applicable to the mode of transportation and may conform to the contractor's commercial practice.

5.1.1.3 Marking. Shipment information shall be provided on interior packages and exterior shipping containers in accordance with the contractor's commercial practice. The information shall include nomenclature, National stock number or manufacturer's part number, contract or order number, contractor's name and destination.

5.2 Domestic shipment and storage or overseas shipment. The requirements and levels of preservation, packaging, packing and marking for shipment shall be as specified (see 6.2.1).

6. NOTES

6.1 Intended use.

6.1.1 Type I valves. Pressure reducing valves (type I) specified herein are intended for installation in air or nitrogen systems where the inlet pressure to the valve is 150 lb/in² gauge (or below) and it is required to maintain a constant (within the accuracy limits specified) lower pressure downstream of the valve. The valve maintains this constant delivered pressure during flow and supply pressure variations by automatically throttling (or shutting off flow) as necessary based on a signal feedback of the downstream pressure.

6.1.2 Type II valves. Back pressure regulating valves (type II) specified herein are intended for installation in low pressure (150 lb/in² gauge or below) air or nitrogen systems for the purpose of maintaining the pressure immediately upstream of the valve within predetermined limits. The valve senses upstream pressure and begins to open when it reaches the set pressure. The valve is fully open when inlet pressure reaches the accumulation pressure and it reseats by the time the inlet pressure has decayed down to the blowdown pressure.

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6.1.3 Type III valves. Priority valves (type III) specified herein are a specific application of a back pressure regulation valve (type II) intended for installation in low pressure (150 lb/in² gauge or below) air or nitrogen systems for the purpose of protecting the supply pressure to essential or "priority" services by throttling down or cutting off the flow to all nonessential services if and when necessary. This is accomplished by installing the valve downstream of the essential service take-offs but upstream of the nonessential service take-offs. The valve senses the pressure upstream of it (the essential services pressure) and acts to throttle down (or completely shut off if necessary) the flow through it (that is, the flow to the nonessential services) at any time the sensed pressure drops down to a level which would represent a threat to the continued operation of the essential services.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type required (see 1.2).
- (c) Class and design required (when a specific class and design are required) (see 1.2 and 1.2.1).
- (d) Nominal size required (nominal pipe size).
- (e) Flow capacity required (standard ft³/min).
- (f) When first article is required (see 3.1).
- (g) Adjustable range of set pressures required (see 3.3.8).
- (h) Performance requirements if other than specified in 3.4, (see 3.4.1.1, 3.4.2.1, and 3.4.3.2).
- (i) Range of ambient temperatures and pressures which the valve will be subjected to in service (see 3.4.6).
- (j) Range of service conditions (inlet or outlet pressure variations, as applicable).
- (k) When shock and vibration tests are required (see table II).
- (l) Preservation, packaging, packing and marking if other than that specified in 5.1 (see 5.2).
- (m) Brief description of application and any special performance or construction requirements.

6.2.2 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DoD FAR Supplement, Part 27, Sub-Part 27.475-1 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification are cited in the following paragraphs.

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<u>Paragraph no.</u>	<u>Data requirement title</u>	<u>Applicable DID no.</u>	<u>Option</u>
3.6 and appendix A	Drawings, engineering and associated lists	DI-E-7031	---

(Data item descriptions related to this specification, an identified in section 6 will be approved and listed as such in DoD 5010.12-L, AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

6.2.2.1 The data requirements of 6.2.2 and any task in sections 3, 4, or 5 of this specification required to be performed to meet a data requirement may be waived by the contracting/acquisition activity upon certification by the offeror that identical data were submitted by the offeror and accepted by the Government under a previous contract for identical item acquired to this specification. This does not apply to specific data which may be required for each contract regardless of whether an identical item has been supplied previously (for example, test reports).

6.2.2.2 Technical manuals. The requirement for technical manuals should be considered when this specification is applied on a contract. If technical manuals are required, Military specifications and standards which have been cleared and listed in DoD 5010.12-L (AMSDL) must be listed on a separate CDRL (DD Form 1423), included as an exhibit to the contract. The technical manuals must be acquired under separate contract line item in the contract. Technical content shall include the requirements of the appendix B, titled Manual Technical Content Requirements.

6.3 First article. When a first article inspection is required, the item should be a first article sample. The first article should consist of one unit. The contracting officer should include specific instructions in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.4 Definitions.

6.4.1 All valves. The following definitions are applicable to all valves:

- (a) Nominal pressure - The approximate maximum pressure which the valve will be subjected to in service under normal conditions.
- (b) Design pressure and temperature - The maximum pressure and temperature the valve should be subjected to under any condition. The pressure and temperature upon which the strength of the pressure containing envelope is based.

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- (c) Proof pressure - The maximum test pressure that the valve is required to withstand without damage. Valve operation is not required during application of the proof pressure, but after the pressure has been removed, the valve will meet all performance requirements.
- (d) Burst pressure - The maximum test pressure that a valve is required to withstand without complete or dangerous structural failure. The valve is not required to operate either during or following the application of burst pressure. Normally a burst test is not required under this specification.

6.4.2 Type I. The following definitions apply specifically to type I valves:

- (a) Set pressure - The downstream pressure which the valve is set to maintain under a given set of operating conditions (that is, inlet pressure and flow).
- (b) Accuracy of regulation - The maximum permissible band over which the downstream pressure may vary when the valve is set at any pressure within the required range of adjustment and is subjected to any combination of inlet pressure, flow demand, and ambient temperature variations, within the specified limits.
- (c) Set pressure limits - The range of set pressures over which the valve can be adjusted while meeting the performance requirements specified.
- (d) Lock-up pressure - The reducing valve outlet pressure under shut-off condition (that is, when the flow is reduced to a point where it is equal to or less than the allowable leakage (see 3.4.1.3)).

6.4.3 Type II. The following definitions apply specifically to type II valves:

- (a) Set pressure - The pressure at which the valve begins to open on increasing inlet pressure; expressed in lb/in² gauge.
- (b) Set pressure range - The range over which the set pressure can be adjusted without interchanging parts.
- (c) Accumulation - The increase in inlet pressure, above the set pressure, required to pass rated flow; expressed in lb/in² or a percent of the set pressure.
- (d) Accumulation pressure - The set pressure plus the accumulation; expressed in lb/in² gauge.
- (e) Blowdown - The decrease in inlet pressure below the set pressure, required for the valve to reseal; expressed in lb/in² or as a percent of the set pressure.
- (f) Blowdown pressure - The set pressure minus the blowdown; expressed in lb/in² gauge.

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6.4.4 Type III. The following definitions apply specifically to type III valves:

- (a) Reseat pressure - The inlet pressure at which the valve reseats on decreasing inlet pressure.
- (b) Set pressure - In this specification, the set pressure is defined as the reseat pressure.
- (c) Set pressure range - The range over which the set pressure can be adjusted without interchanging parts.
- (d) Full open pressure - The inlet pressure at which the valve is required to be fully open.
- (e) Capacity rating - The flow capacity of the valve when the inlet pressure equals or exceeds the full open pressure.

6.5 Sub-contracted material and parts. The packaging requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

6.6 Subject term (key word) listing.

Bottom cap
Burst pressure
Gas dome
Nominal pressure rating
Pressure envelope
Proof pressure
Set pressure
Spring housing

6.7 Changes from previous issue. Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing activity:
Navy - SH
(Project 4820-N037)

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APPENDIX A

DRAWING TECHNICAL CONTENT REQUIREMENTS

10. SCOPE

10.1 Scope. This appendix covers the information that should be included in the drawings when specified in the contract or order. This appendix is applicable only when the appropriate data item description is cited on the DD Form 1423.

20. APPLICABLE DOCUMENTS

20.1 Government documents.

20.1.1 Specifications. The following specification forms a part of this appendix to the extent specified herein. Unless otherwise specified, the issues of this document shall be that listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

MILITARY

DOD-D-1000 - Drawings, Engineering and Associated Lists.

30. DRAWING CONTENT

30.1 Drawing content. When specified in the contract or order, the drawings shall include the information specified in 30.1.1 through 30.1.1.3.

30.1.1 Drawings. Drawings shall be in accordance with level 1 and level 3 of DOD-D-1000 as applicable.

30.1.1.1 Preliminary drawings. Preliminary drawings which permit evaluation of the design and approval of materials shall show the following:

- (a) Accurately scaled sectional assembly which clearly depicts the design and construction of the valve.
- (b) Bill of material listing specification, grade, condition and any other data required to fully identify the properties of the materials proposed.
- (c) Details of the seat, disc and stem assembly and all other replaceable internal trim.
- (d) Outline dimensions, disassembly space, location and size of end connections and mounts.
- (e) Estimated weight and limitations on installation.
- (f) Reference previous shock and vibration approval for valve and test report numbers.
- (g) Recommended assembly torques, or equivalent procedures, for all threaded parts.
- (h) Table of spring data (where applicable).

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30.1.1.2 Final drawings. Final drawings and certification data sheets shall be in accordance with DOD-D-1000. The following data shall be furnished:

- (a) Ship identification.
- (b) Applicable assembly drawing numbers.
- (c) Applicable manual number.
- (d) CID allowance parts list (APL) number.
- (e) Application description.
- (f) Valve description.
- (g) The set pressure and adjustable range of valve.
- (h) Required accuracy of regulation over specified range of operating conditions.
- (i) Rated accuracy of regulation over specified range of operating conditions.
- (j) Required maximum capacity under specified conditions.
- (k) Rated maximum capacity under specified conditions.
- (l) Fail-open capacity (for purposes of relief valve sizing) (type I only).
- (m) Deviations in materials or end connections from assembly drawing.

30.1.1.3 Limited rights legend. When the Government has only limited rights in the data shown on the drawings, as determined by the contractual provisions regarding rights in technical data, the drawings furnished may be marked with the following restrictive legend.

"Furnished under United States Government Contract No. _____.
Shall not be either released outside the Government, or used, duplicated, or disclosed in whole or in part for manufacture or procurement, without the written permission of _____,
except for: (a) emergency repairs or overhaul work by or for the Government, where the item or process concerned is not otherwise reasonably available to enable timely performance of the work; or (b) release to a foreign government, as the interests of the United States may require; provided that in either case the release, use duplication or disclosure hereof shall be subject to the foregoing limitations. This legend shall be marked on any reproduction hereof in whole or in part."

APPENDIX B

MANUAL TECHNICAL CONTENT REQUIREMENTS

10. SCOPE

10.1 Scope. The appendix covers information that should be included in the technical manuals when specified in the contract or order. This appendix is applicable only when the appropriate data item description is cited on the DD Form 1423.

20. APPLICABLE DOCUMENTS

20.1 Government documents.

20.1.1 Specification. The following specification forms a part of this appendix to the extent specified herein. Unless otherwise specified, the issue of this document shall be that listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATION

MILITARY

MIL-M-15071 - Manuals, Technical Equipments and Systems Content Requirements for.

30. TECHNICAL MANUAL CONTENT

30.1 Technical manual content. When specified in the contract or order, the technical manuals shall include the information specified in 30.1.1.

30.1.1 Manuals. Manuals shall be furnished in accordance with type I of MIL-M-15071. The following, in addition to that required for type I of MIL-M-15071, shall be included as part of the manual contents:

- (a) The approved engineering drawings for the valve (including certification data sheet). These drawings shall be supplemented by additional illustrations where necessary to adequately illustrate operation and maintenance. These additional illustrations may consist of blowouts, partial or full sections, and so forth, and may eliminate extraneous lines and details to clarify the interaction of parts.
- (b) Table listing wrench sizes and assembly torques (or other equivalent procedures) for making up all joints and threaded assemblies.
- (c) Instructions to permit overhaul by shipyard or other repair facility. These should include procedures for checking all critical dimensions subject to wear or change and the acceptable dimensional limits, surface finish condition, and so forth. Also, the appropriate procedure (that is, part replacement, correction at repair facility, or repair at manufacturer's facility) which should be followed to correct each case of damage or wear.

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- (d) Detailed disassembly and reassembly procedures. In addition to providing procedures for the complete disassembly and reassembly of the equipment, maintenance and troubleshooting sections shall contain, or refer to, only the limited disassembly and reassembly required to accomplish each particular operation. This is intended to reduce the possibility of unnecessary disassembly and unnecessary disturbance of adjustments when performing specific or limited maintenance or troubleshooting operations.
- (e) Adjustment procedures.

