

INCH-POUND

MIL-V-17501F(SH)

29 October 1990

SUPERSEDING

MIL-V-17501E(SH)

24 March 1970

MILITARY SPECIFICATION

VALVES, CONTROL TYPE, MAGAZINE, AND HANGAR DECK SPRINKLER

This specification is approved for use by 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 magazine and hangar deck sprinkler control type valves for shipboard service.

1.2 Classification. Valves shall be of the following types and classes as specified (see 6.2):

Type I – Diaphragm actuated, hydraulic operated, 250 pounds per square inch (lb/in^2)

class 1 – Sprinkler supply, globe type, normally closed with manual actuation

Class 2 – Remote control, globe type, normally closed

class 3 – Lift check, spring loaded, globe type, normally closed

Class 4 – Hydraulic check, globe type, normally closed

Class 5 – Hydraulic control, globe type, normally closed

Class 6 – Three-way control, four port

Type 11 – Manual operated, 250 lb/in^2 , rotary disc plate type.

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 55Z3, 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.

AMSC N/A

FSC 4810

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATIONS

FEDERAL

QQ-A-601	Aluminum Alloy Sand Castings
QQ-B-626	Brass, Leaded and Nonleaded: Rods, Shapes, Forgings, and Flat Products with Finished Edges (Bar and Strip)
QQ-B-637	Brass Naval: Rod, Wire, Shapes, Forgings, and Flat Products with Finished Edges (Bar, Flat Wire, and Strip)
QQ-B-654	Brazing Alloys, Silver
QQ-N-281	Nickel-Copper Alloy Bar, Rod, Plate, Sheet Strip, Wire, Forgings, and Structural and Special Shaped Sections
QQ-W-390	Wire. Nickel-Chromium-Iron Alloy
QQ-W-428	Wire, Steel, Carbon (High Carbon, Round, for Mechanical Springs, General Purpose)

MILITARY

MIL-V-3	Valves, Fittings, and Flanges (Except for Systems Indicated Herein); Packaging of
MIL-S-901	Shock Tests, HI (High-Impact) Shipboard Machinery, Equipment, and Systems, Requirements for
MIL-G-1 149	Gasket Materials, Synthetic Rubber, 50 and 65 Durometer Hardness
MIL-F-1 183	Fittings, Pipe, Cast Bronze, Silver Brazing, General Specification for

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MIL-P-5315	Packing, Preformed, Hydrocarbon Fuel Resistant
MIL-C-8068	Cloth, Coated, Nylon, Rubber-Coated, Fuel-Resistant
MIL-P-15024	Plates, Tags, and Bands for Identification of Equipment
MIL-P-15024/5	Plates, Identification
MIL-T-16420	Tube, Copper-Nickel Alloy, Seamless and Welded (Copper Alloy Numbers 715 and 706)
MIL-B-16541	Bronze, Valve: Castings
MIL-F-2o042	Flanges, Pipe and Bulkhead, Bronze (Silver Brazing)

STANDARDS

FEDERAL

FED-STD-H28	Screw-Thread Standards for Federal Services
FED-STD-H2W7	Screw-Thread Standards for Federal Serices Section 7 Pipe Threads, General Purpose

MILITARY

MIL-STD-130	Identification Marking of US Military Property
MIL-STD-167-1	Mechanical Vibrations of Shipboard Equipment (Type I – Environmental and Type 11 – internally Excited)
MIL-STD-777	Schedule of Piping, Valves, Fittings, and Associated Piping Components for Naval Surface Ships

(Unless otherwise indicated, copies of federal and militay specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, Robbins Avenue, Philadelphia, PA 19111-5094)

2.2 Non-Government publications. The following document(s) form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DOD adopted are those listed in the issue of the DODISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DODISS are the issues of the documents cited in the solicitation (see 6.2).

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AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

A 193	Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service; (DOD adopted)
A 276	Standard Specification for Stainless and Heat-Resisting Steel, Bars and Shapes; (DOD adopted)
A 228	Standard Specification for Steel, Wire, Music Spring Quality; (DOD adopted)
A 313	Standard Specification for Chromium-Nickel Stainless and Heat-Resisting Steel Spring Wire; (DOD adopted)
A 582	Standard Specification for Free-Machining Stainless and Heat-Resisting Steel Bars, Hot-Rolled or Cold-Finished
B 61	Standard Specification for Steam or Valve Bronze Castings; (DOD adopted)
B 164	Standard Specification for Nickel-Copper Alloy Rod, Bar, and Wire; (DOD adopted)
B 179	Standard Specification for Aluminum Alloys in Ingot Form for Sand Castings, Permanent Mold Castings, and Die Castings; (DOD adopted)
B 194	Standard Specification for Copper Beryllium Alloy Plate, Sheet, Strip and Rolled Bar; (DOD adopted)
D 710	Standard Specification for Vulcanized Fiber Sheets, Rods, and Tubes 'Used for Electrical Insulation; (DOD adopted)
D 2000	Standard Classification System for Rubber Products in Automotive Applications; (DOD adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.)

(Non-Government standards and other publications are normally available from the organizations that prepare or 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, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

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3. REQUIREMENTS

3.1 Qualification. Valves furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time of award of contract (see 4.3 and 6.5).

3.2 Materials. The materials of parts shall be as specified in table I. Alternate materials not specified herein shall not be used unless prior approval by Naval Sea Systems Command (NAVSEA) has been received. Such materials shall be suitable for long-term reliable service under the operating conditions specified. Such materials shall be subject to the results of qualification tests and examinations and to acquiring activity concurrence. In selecting materials, contractors should consider that, in addition to service usage, these valve assemblies shall be subject to periods of inactivity. Lightness of weight shall be a consideration; use of magnesium is not approved. For parts working against each other, materials shall be selected to prevent galling, seizing, and excessive wear. Material identification shall include the commercial, industrial, federal, or military specification to which the material conforms and shall indicate the type, grade, or class of the material if classified in the applicable material specification. Materials used in the construction of components shall be shown and identified on the appropriate drawings and associated lists of those components (see 6.3).

TABLE I. Materials and application.

Name of part	Material	Applicable document	Application						
			Type I and class (CL)						Type II
			CL1	CL2	CL3	CL4	CL5	CL6	
Valve Body	Bronze	MIL-B-16541 ASTM B 61	X	X	X	X	X	X	
Intermediate valve body	Bronze	MIL-B-16541 ASTM B 61	X			X	X		
Distributor body	Bronze	MIL-B-16541 ASTM B 61							X
Valve seat	Ni-Cu alloy	QQ-N-281 ASTM B 164	X	X	X	X	X		X
Valve seat (upper and lower)	Ni-Cu alloy	QQ-N-281 ASTM B 164						X	
Valve disc/retainer assembly	Ni-Cu alloy	QQ-N-281 ASTM B 164	X	X	X	X	X	X	
	Synthetic rubber	MIL-C-8068 ASTM D 2000	X	X	X	X	X	X	
Valve disc and skirt	Ni-Cu alloy	QQ-N-281 ASTM B 164							X
Valve stem and guides	Ni-Cu alloy	QQ-N-281 ASTM B 164	X	X	X	X			

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TABLE I. Materials and application - Continued.

Name of part	Material	Applicable document	Application						
			Type I and class (CL)						Type II
			CL1	CL2	CL3	CL4	CL5	CL6	
Valve stem	Ni-Cu alloy	QQ-N-281 ASTM B 164					X	X	X
Plug, cap	Bronze	MIL-B-16541 ASTM B 61	X				X		
Cover	Bronze	MIL-B-16541 ASTM B 61	X	X	X	X	X	X	X
Spring (internal) ¹	Nickel-chromium-iron	QQ-W-390	X	X	X	X	X	X	X
Diaphragm	Synthetic rubber	MIL-C-8068 ASTM D 2000	X	X	X	X	X	X	
O-rings	Synthetic rubber	MIL-P-5315	X	X	X	X	X	X	X
Diaphragm washer	Ni-Cu alloy	QQ-N-281 ASTM B 164	X	X	X	X	X	X	
Washers	Ni-Cu alloy	QQ-N-281 ASTM B 164							X
Indicator washer	Fiber	ASTM D 710	X						
Unions	Bronze	MIL-F-1183	X	X	X	X	X	X	X
Tube	Cu-Ni	MIL-T-16420 (70-30, type I)	X			X	X	X	
Gasket	Synthetic rubber	MIL-G-1149 ASTM D 2000	X			X			X
Test fitting	Aluminum alloy (removable)	QQ-A-601 ASTM B 179	X						
	Bronze (permanent)	MIL-B-16541 ASTM B 61	X						
Pin	Ni-Cu alloy	QQ-N-281 ASTM B 164	X						
Roll pin	Copper-beryl alloy	ASTM B 194							X
	Stainless steel	ASTM A 276							X
Indicator stem	Brass	QQ-B-637	X						

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TABLE I. Materials and application - Continued

Name of part	Material	Applicable document	Application						
			Type I and class (CL)						Type II
			CL1	CL2	CL3	CL4	CL5	CL6	
Indicator assembly adapter	Stainless steel	ASTM A 582	X						
Indicator assembly housing	Brass	QQ-B-637	X						
Indicator assembly sight tube	Pyrex	Commercial	X						
Spacer	Ni-Cu alloy	QQ-N-281 ASTM B 164					X		
Brazing ring	Silver alloy	QQ-B-654					X		
Spring (external)	Stainless steel	ASTM A 313							X
Driver	Ni-Cu alloy	QQ-N-281							X
Handle and lever	Aluminum alloy	QQ-A-601 ASTM B 179							X
Key	Brass	QQ-B-637							X
Retaining ring	Ni-Cu alloy	QQ-N-281							X
Chain	Brass	QQ-B-626	X						X
Screws	Stainless steel	ASTM A 193	X	X	X	X	X	X	X
	Brass	QQ-B-637		X			X	X	
	Ni-Cu alloy	QQ-N-281 ASTM B 164	X		X	X			
Bolts and studs	Ni-Cu alloy	QQ-N-281 ASTM B 164	X			X			
Nut	Ni-Cu alloy	QQ-N-281 ASTM B 164	X	X	X	X	X	X	
Data plate	Brass	QQ-B-626	X	X	X	X	X	X	
Dial/data plate	Brass	QQ-B-626							X

¹For springs not in a wetted chamber, springs may be plastic or rubber coated carbon steel ASTM A 228 for diameters of 0.250 inch and under; and QQ-W-428 over diameters greater than 0.250 inch.

²On class 1 valves larger than 2-inch, diaphragm washer material may be bronze MIL-B-16541 or ASTM B 61

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3.3 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.

3.4 Component parts. Table I lists the general component parts and their application to the valves covered in this specification. The part’s application is intended for guidance only; however, when parts listed are incorporated in the valve construction, materials of such parts shall be as specified. This general guidance shall not relieve the contractor from delivering valves that meet the specified requirements of this document.

3.5 Construction. Control valves shall be constructed for use with seawater. Functional construction characteristics for type I, class 1 through 6, and type II valves shall be as specified in 3.5. 1 through 3.5.3 (see 6.3). Weight and size of the assembled valves shall be kept to a minimum.

3.5.1 Design pressure. Control valves shall be constructed for an internal operating pressure of 250 lb/in² and shall withstand an internal test pressure as specified in 4.6.3. The bonnet, dome, cover, or distributor portion of the valve shall be constructed to withstand the highest control pressure to which it will be subjected in the specified working range.

3.5.2 Type I. Control valves of the type I classification shall be constructed for hydraulic operation. The movement of the valve disc shall be positively actuated by hydraulic pressure upon the diaphragm when subjected to a minimum fluid pressure of 40 lb/in² while controlling fluids in a range of 40 to 250 lb/in². Diaphragms shall not be employed as a disc or seating element. Control valves shall be constructed so that failure of the diaphragm will cause the valve to remain closed and shall seat with line pressure. Control valves shall be of the globe pattern construction in which all moving parts shall be guided. Type I valve construction shall be as specified (see 3.6 through 3.6.16).

3.5.2.1 Class 1. Sprinkler supply valves shall be constructed to be held in the closed position by a combined force of valve spring and inlet firemain supply pressure acting on the valve disc. The valves shall be constructed to open rapidly when actuated by hydraulic pressure and close rapidly when hydraulic pressure is released. These valves shall permit control of seawater flow to the system’s sprinkler head valves. Class d valves shall be constructed with an atmospheric vent, a valve position indicator, a test fitting, and a manual actuation mechanism.

3.5.2.2 Class 2. The remote control valve shall be constructed to be held in the closed position by an internal valve spring when the control system piping is not pressurized. The valve shall be constructed to open fully and close completely when actuated by hydraulic pressure. This valve shall permit securing of the sprinkler supply valve from an operation station other than the one from which actuation occurred.

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3.5.2.3 Class 3. The spring-loaded lift check valve shall be constructed to be held in the closed position by an internal valve spring when the control system piping is not pressurized. The valve shall be constructed to open fully and establish flow through the valve when hydraulic pressure is applied to the inlet side of the valve. The valve shall close completely when hydraulic pressure is applied in the reverse direction through the outlet side of the valve. This valve shall permit the control system to be operated from more than one operating station by preventing reverse flow.

3.5.2.4 Class 4. The hydraulic operated check valve shall be constructed to be held in the closed position by an internal valve spring. The valve shall open fully when hydraulic pressure is applied to the valve through an actuation connection and close completely when pressure is relieved. This valve shall provide the means for venting the hydraulic pressure from the sprinkler supply valve, thereby permitting the sprinkler supply valve to close.

3.5.2.5 Class S. The hydraulic operated control valve shall be constructed to be held in the closed position by an internal valve spring when the control system piping is not pressurized. The valve shall open fully when hydraulic pressure is applied to the valve through an actuation connection. The valve shall close completely by a combination of valve spring force and firemain pressure when hydraulic actuation pressure is relieved. This valve shall admit seawater at full firemain pressure to the actuation portion of the sprinkler supply valve, thereby permitting the sprinkler supply valve to open.

3.5.2.6 Class 6. The three-way control valve shall be constructed to control the operation of the sprinkler head valves in a wet type sprinkler system. The valve shall be a three-way valve with a control system actuating connection and shall permit hydraulic pressure from a pressurized accumulator tank to be applied to the sprinkler head valves when the control system is not operating, thereby permitting the sprinkler head valves to remain closed. The valve shall isolate and release pressure from the sprinkler head valves when the control system is actuated, thereby permitting the sprinkler head valves to open.

3.5.3 Type II. Unless otherwise specified (see 6.2), control valves of the type II classification shall be constructed for manual operation. This valve shall be of the three-port, three-position or the three-port, two-position rotary disc plate construction with an operating mechanism containing a device for locking the valve in any of its positions (see 3.6.1 1). The valve shall have one inlet (supply) port and two outlet ports. This valve shall permit manual control of the hydraulic sprinkler control system. Type II valve construction shall be as specified (see 3.6 through 3.6.16).

3.6 Construction. Valves covered in this specification shall meet the physical limitations and stress requirements as specified.

3.6.1 Configuration. Type I valves shall be configured for in-line installation. Type H valves shall be configured for through bulkhead type mounting. Type I, class 1 valves shall be configured for flanged installation. Type I, class 2 through 4, and type II valves shall be configured for 3/13-inch nominal pipe size (rips) union installation. Type I, class 5 valves shall be configured for 1-inch union installation and class 6 valves shall be configured for 1 /2-inch union installation.

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3.6.1.1 Valve dimensions. Unless otherwise specified (see 6.2), type I, class 1 valve sizes and dimensions shall be in accordance with table II and shall be suitable for the bolting indicated. Type I, class 2 through 6, and type II valves shall be 3/4-inch rips, valves shall be of 3/8 through 1-inch rips. Valve connections shall be as specified in 3.6.2 through 3.6.3.

TABLE II. *Type I, class 1 valve sizes and dimensions.*

Valve size (nps) ¹	Face to face of flanges ¹	Flange diameter ²	Flange thickness ²	No. of bolt holes ²	Diameter of bolt hole ²
1	8-1/2	4-1/4 ¹	3/4 ¹	4	9/16 ¹
1-1/4	8-3/4	4-1/2	13/16	4	9/16
1-1/2	8-3/4	5-1/16	13/16	6	9/16
2	11-1/2	5-9/16	13/16	6	11/16
2-1/2	12-1/2	6-1/8	15/16	6	11/16
3	13	6-5/8 ¹	15/16 ¹	8	11/16 ¹
3-1/2	13-3/4	7-3/16	1	8	11/16
4	15	7-11/16	1	8	11/16
5	16-3/4	9-1/16	1-1/16	10	11/16
6	20	10-1/8	1-3/16	12	11/16
8	25-3/4	12-3/8	1-5/16	14	11/16
10	31-1/8	15	1-7/16	15	13/16
12	35-1/2	17-5/8	1-1/2	18	13/16

¹Dimensions in inches²Bolting requirements

3.6.2 Connections. Valve connections shall be as specified. Inlet and outlet connections shall be integral with the valve body whenever possible. The valves shall have nps bore.

3.6.2.1 Inlet and outlet connections. Type I, class 1 valves shall have integral flanged connections conforming to MIL-F-20042, class 250 Type I, class 2 through 6, and type II valves shall have silver brazing union connections. Type X, class 2 through 6, and type II valves shall have male American National Taper Pipe Thread (NPT) union connections integral with the valve body whenever possible. If not possible, silver brazing unions consisting of installed male thread-piece, union nut and tailpiece with pre-inserted rings shall be used. Valves using union end connections shall be furnished complete with union nuts and tailpieces with pre-inserted rings. Silver brazing inlet and outlet union connections shall conform to the applicable requirements of MIL-F-1183.

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3.6.2.2 Actuation connections. Valves, except type I, class 1, 1-inch size, shall have 3/8-inch silver brazing union actuation connections. The type I, class 1, 1-inch size valves shall have 1/4-inch silver brazing union connections. Valve union actuation connections shall be furnished complete with union nuts and tailpieces with pre-inserted rings. Silver brazing actuation union connections shall conform to the applicable requirements of MIL-F-1 183.

3.6.2.3 Flange finishes. The machine surface finish of gasket mating surfaces on flanges shall be in accordance with the applicable requirements of MIL-STD-777.

3.6.3 Threaded parts. Threaded parts shall be in accordance with FED-STD-H28 and all applicable detailed standards of FED-STD-128. Union threaded ends shall be as specified in FED-STD-H28 and FED-STD-H28/7. Through bolting shall be the preferred method of joining mating parts whenever possible. If not possible, the use of studs is preferred to the use of capscrews or tapbolts. Bolts and studs shall be of sufficient length to ensure that when nuts are tightened, there shall be at least one thread projection above the outer face of each nut. Type I, class 1 removable test fitting extension threads shall be as specified in 3.6.13.

3.6.4 Discs and stems. Valve discs and stems shall be positively guided to prevent binding or seizing caused by lateral or angular thrust and to ensure proper seating.

3.6.5 Seats. Valve seats shall be integral with the valve body or of non-integrated removable design.

3.6.6 Spring. Springs shall be constructed so that they will not be fully compressed under normal operation or adjustment within the working pressure range of the valve. When removed from the valve and compressed solid, the springs shall not take a permanent set exceeding 0.10 inch per inch of face length of spring after a 10 minute period at the time the valve is submitted for test. Springs for hydraulic actuated valves shall be sufficiently strong to close the valve under no flow conditions with the firemain pressure in the valve. When carbon steel springs are used, they shall be plastic or rubber coated.

3.6.7 Gaskets and washers. Gaskets and washers shall be constructed of materials suitable for the services intended (see 6.1). Bearing surfaces of nuts and bolt heads and their respective mating surfaces on the valves shall be machine finished.

3.6.8 Stuffing boxes. Internal packed stuffing boxes shall not be used.

3.6.9 Atmospheric vent. Type I, class 1, 4, and 5 valves shall have atmospheric vent holes to provide visual indication of a ruptured diaphragm or leakage past O-rings.

3.6.10 Position indicator. Type I, class 1 valve construction shall incorporate a valve position indicator. Valve position shall be easily identifiable. Valve full open to full closed positions shall be within viewing range.

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3.6.11 Manual operating mechanism. The operating mechanism for type II valves shall consist of a handle and a spring-loaded lever containing a position indexing pin. The valve cover shall have indexing holes that shall permit the valve to remain in one of the designated positions. Type II valves operating mechanism shall be constructed for through bulkhead operation, thereby permitting valve operation from an adjacent compartment. A locking device with provisions for wiring the device in place shall be provided. Type I, class 1 valves shall incorporate a manual operating mechanism for emergency valve operation. The type I, class 1 manual operating mechanism shall operate smoothly and rapidly and shall not interfere with the valve's flow or normal hydraulic actuation.

3.6.12 Dial plate. Type II valves shall have a dial plate permanently attached to the valve cover. The dial plate shall contain capitalized valve position nomenclature in accordance with figure 1. The dial plate may also contain valve identification information as specified in 3.11.3.

3.6.13 Test fittings. Unless otherwise specified (see 6.2), removable test fittings shall be constructed to be screwed onto the bottom portion of type I, class 1 valve bodies in place of the bottom cap. The test fitting shall be a one-piece casting that incorporates a threaded bottom cover and a male threaded extension for accommodating a firehose coupling. The male threaded extension shall conform to national firehose threads. For type I, class 1 valve sizes 1 to 3 inches, the extension thread size shall be 1- 1/2 inches, 11 threads per inch (TPI), and for valve sizes 3- 1/2 to 12 inches the thread size shall be 2-1/2 inches, 7-1/2 TPI.

3.6.14 Removable parts. Temporarily removable valve parts such as bottom caps and locking devices shall have a permanent means, such as a chain or braided wire, for connecting the removable part to the valve body. This requirement shall not include removable test fittings.

3.6.15 Alignment. Components and assemblies that are alignment-critical shall be positively held in place by dowel pins, fitted bolts, keys, rabbeted or tongue and groove joints, or other indexing means, as appropriate. The construction shall ensure that the alignment is not disturbed or any undue stresses are induced in service as a result of the alignment means. Where the bonnet, dome or cover and body or distributor incorporate valve stem guides, the bonnet, dome or cover and body or distributor mating flanges shall be provided with a positive means to facilitate and maintain perfect alignment of the valve stem guides to ensure free movement at any angle of valve installation in service.

3.6.16 Installation orientation. Although type I valves are normally installed with the valve body horizontal, they shall be suitable for free and smooth operation in any position. Type II valves shall be constructed for through bulkhead type installation with the stem in the horizontal position.

3.7 Shipboard environmental conditions. Valves shall be constructed to perform their required functions in a reliable manner when installed and operated on board Navy ships under the specified shipboard environmental conditions, which shall be understood to prevail simultaneously and to occur in any combination.

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3.7.1 Atmosphere. The valves shall be constantly exposed to a marine environment that shall be understood to include extremes of ambient temperatures, high humidity in a sea atmosphere, and conditions conducive to electrolytic corrosion of dissimilar metals.

3.7.2 High impact shock The valves shall be constructed to withstand high impact shock and remain functionally reliable. The valves shall pass the shock test specified in 4.6.1. For general information on shock tests, MIL-S-901 should be consulted.

3.7.3 Vibration. The valves shall be exposed to ship environmental vibrations. They shall meet the vibration requirements as specified in 4.6.2.

3.8 Safety criteria. The construction shall be so that valve operation and any necessary maintenance shall be effected in a safe manner. Exposed edges shall be rounded and made smooth to prevent injury to personnel. There shall be no pockets that can retain pressure after pressure to the valve has been released.

3.9 Interchangeability. In no case shall parts be physically interchangeable or reversible unless such parts are also interchangeable or reversible with regard to function, performance, and strength.

3.10 Cleanliness. Parts shall be thoroughly cleaned after manufacture. After assembly, internal areas shall be purged clean of all construction debris, then the openings shall be sealed against contamination.

3.11 Marking. Valves and valve parts shall be marked as specified below.

3.11.1 Direction of flow. If the valves are constructed so that flow through the valves is permissible in one direction only, an arrow indicating the direction of flow shall be cast on or otherwise made a permanent part of the valve body. Stamping or other practices which reduces body thickness shall not be acceptable.

3.11.2 Valve parts. Parts shall be marked for identification on a nonworking surface. Marking shall be in accordance with MIL-STD-130. In addition, when specified (see 6.2), the discs shall be stamped to indicate the intended use and the design capacity of the valve. Furnished union connections shall contain the required markings as specified in MIL-F-1183.

3.11.3 Identification plate. An identification plate in accordance with MIL-P-15024, and MIL-P-15024/5 shall be permanently attached to all valves. Type 11 valves identification information may be contained on the valve dial plate (see 3.6.12). Identification plates shall contain the following information:

- a. Contractor's name or trademark
- b. Valve size and rating
- c. Contractor's identification number (Commercial and Government Entity (CAGE))
- d. MIL-V-17501 (military specification number)
- e. Component identification number (CID)
- f. Contract number.

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3.12 Special tools. Common tools and wrenches listed in the Federal Supply Catalog shall not be furnished. A copy of this catalog is available for review in the local office of the Defense Contract Administration Services Management Area (DCASMA). The need for special tools shall be confirmed during performance of qualification testing and examinations. The need for special tools for adjustments or maintenance shall be minimized. When specified in the contract or order (see 6.2), special tools required shall be furnished in sets, designated as On Board Special Tools.

3.13 Workmanship. Valves shall be free from defects that affect their appearance or that may affect their operation. Castings shall be clean, sound, and free from blow holes, hard spots, porosity, cracks, and other injurious defects. They shall be smooth and well cleaned, both inside and outside. Fins and roughness shall be removed. Castings shall not be repaired, plugged, impregnated, brazed, or burned.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order (see 6.2), the contractor is responsible for the performance of all inspection requirements (examinations and tests) 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 ensure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items shall 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 ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of the manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

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

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

4.3 Qualification inspection. Qualification inspection Shall be performed at a laboratory acceptable to the Government on sample valves produced with equipment and procedures normally used in production (see 6.5).

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43.1 Sample. One valve of each type and class shall be selected as a sample for qualification inspection. Each sample shall be produced with equipment and procedures normally used in production. Qualification approval of a type I, class 1, 2-inch size valve shall qualify the 1-inch through 3-1/2 inch size valve. Qualification approval of a type I, class 1, 6-inch size valve shall qualify the 4- through 8-inch size valve. Other valves covered by this specification shall have each type, class, and size separately inspected for qualification acceptance. Sample valves shall be subjected to and pass the test requirements as specified.

43.2 Inspection routine. Sample valves shall be subjected to the qualification inspection specified in table III in the order shown.

TABLE III. Qualification and quality conformance inspection.

Examination and test	Test	Qualification	Quality conformance
Visual and dimensional examination	4.5	X	X
High impact shock	4.6.1	X	
Vibration	4.6.2	X	
Hydrostatic	4.6.3	X	X
Leakage	4.6.4	X	X
Operational	4.6.5	X	X
Service life	4.6.6	X	
Simulative service	4.6.7	X	

433 Failures. Failure to pass the examination and test requirements specified in table III shall be cause for refusal to grant qualification.

4.4 Retention of qualification. To retain qualification, the contractor shall forward a report at 3 year intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. The report shall consist of:

- a. A summary of the results of the test performed for inspection of product for delivery, indicating as a minimum the number of lots that have passed and the number that have failed. The results of tests of all reworked lots shall be identified and accounted for.

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- b. A summary of the results of tests performed for periodic inspection, including the number and mode of failures. The summary shall include results of all periodic inspection tests performed and completed during the 3 year period. If the summary of the test results indicates nonconformance with specification requirements, and corrective action acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the qualified products list (QPL).

Failure to submit the report within 30 days after the end of each 3 year period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the contractor shall immediately notify the qualifying activity at any time during the 3 year period that the inspection data indicates failure of the qualified product to meet the requirements of this specification. In the event that no production occurred during the reporting period, a report shall be submitted certifying that the company still has the capabilities and facilities necessary to produce the item. If during two consecutive reporting periods there has been no production, the contractor may be required, at the discretion of the qualifying activity, to submit his other qualified products to testing in accordance with the qualification inspection requirements and provide the reason for no production.

4.4.1 Quality conformance inspection. Quality conformance inspection shall be performed to ascertain that the production items offered conform to the construction which was approved as a result of qualification testing and examination, and the production items offered comply with the requirements set forth in the contract or order (see 6.3).

4.4.2 Sampling. All valves of the same type, class, and size presented for delivery at one time shall be considered a lot for purposes of quality conformance inspection. A random sample of valves shall be selected from each lot for examination and testing as specified in table III. For lot sizes less than nine, 100 percent inspection shall be required.

4.5 Visual and dimensional examination. Each of the sample valves shall be examined to determine conformance to the requirements specified herein as to material, workmanship, dimensions, and other requirements not involving tests. Valves containing one or more visual or dimensional defects shall be rejected.

4.6 Test procedures. Test procedures shall be as specified in 4.6.1 through 4.6.7.

4.6.1 Shock test. High impact shock tests shall be conducted in accordance with MIL-S-901 for grade A, class I equipment. The valve shall be considered acceptable with respect to the high impact shock requirement if the following conditions have been met:

- a. No breakage of any part has occurred. Examination reveals no cracks or signs of weakness that could result in failure if operated.
- b. The valve performs and continues to perform as specified without maintenance or significant adjustment.
- c. There has been no dislocation of valve components that could render the valve unsafe for continued service.

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4.6.2 Vibration. Type I vibration tests for the valve shall be conducted in accordance with MIL-STD-167-1. The valve shall be considered acceptable with respect to the vibration requirement if it continues to perform, as specified, during and after the vibration tests and shows no evidence of weakness or derangement. Operating mechanisms shall not move from the set position.

4.6.3 Hydrostatic test. Assembled valves shall be subjected to a hydrostatic test with the valves in the full open position. The valve shall be pressurized to not less than 375 lb/in² and the pressure maintained for not less than 5 minutes during which time the valve shall be examined. Type I, class 1 valves with removable test fittings shall be retested with the test fitting in place and capped. Valve operating chambers shall be hydrostatically tested to 1.5 times the required maximum constructed operating pressure. The valve shall be considered acceptable with respect to the hydrostatic test requirements in 3.5.1 if it has not shown material deformation, rupture, leakage, or sweating.

4.6.4 Leakage test Assembled valves shall be subjected to a water leakage test to determine valve seating tightness. Valves shall be tested with 40 lb/in² applied to the inlet side of the valve with the discharge side of the valve open for inspection. Type II three-position valves shall have both discharge sides open for inspection. Leakage under this test shall be cause for rejection.

4.6.5 Operational test. Assembled valves shall be tested for smooth and rapid operation within the designed pressure range. Valves shall not hunt, chatter, pound, or create excessive noise. Operating mechanisms shall move smoothly and rapidly with minimal amount of force. Locking devices shall be demonstrated for providing the required protection.

4.6.6 Service life test. Assembled valves shall be subjected to an accelerated service life test consisting of repeated opening and closing of the valve for not less than 2,500 cycles without failure. Reliability under repeated operations shall be determined.

4.6.7 Simulative service test Assembled valves shall be installed in a simulated shipboard sprinkler system and operated at the design pressure for a period of not less than 6 months or a satisfactory period as determined by the qualifying activity.

4.7 Inspection of packaging. Sample 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.

5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition. For the extent of applicability of the packaging requirements of referenced documents listed in section 2, see 6.7.)

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5.1 Preservation, pocking, and marking. Valves shall be individually preserved level A or C, packed level A, B, or C, and marked in accordance with MIL-V-3, as specified (see 6.2). The identification of any preservative used, its method of application and the recommended procedure for removal before placing the valve in service shall be contained on removal tags affixed to the valve components concerned.

5.2 Cushioning, dunnage, and wrapping materials. Cushioning, dunnage, and wrapping materials shall be as specified in 5.2.1 through 5.2.3.

5.2.1 Level A. Loose-fill type materials used for packaging and packing applications such as cushioning, filler, or dunnage are prohibited for materials destined for shipboard installation or stowage.

5.2.2 Level C. When loose-fill materials are used for packaging and packing applications such as cushioning, filler, and dunnage, all containers (unit, intermediate, and shipping) shall be marked or labelled with the following information:

CAUTION

Contents cushioned etc., with loose-fill material not to be taken aboard ship. Remove the discard loose-fill material before shipboard stowage. If required, recushion with cellulose material, bound fiber, fiberboard, or transparent flexible cellular material.

5.2.3 Fire resistant. cushioning, filler, dunnage, and wrapping materials selected, shall have properties (characteristics) resistant to fire.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The valves covered by this specification are intended for use in shipboard fire protection sprinkler systems servicing on board magazines and hangar decks.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of this specification
- b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2)
- c. Type, class, and size required (see 1.2)
- d. Type II valve requirements (three-position or two-position) (see 3.5.3)
- e. Sizes and dimensions of type I, class 1 valves, if other than specified (see 3.6.1.1)
- f. Test fitting requirements (see 3.6.13)
- g. Marking of valve parts (see 3.11.2)
- h. Quantity and type of special tools (see 3.12)
- i. Level of preservation packing, and marking required (see 5.1).

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6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Descriptions (DIDs) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DIDs are tailored to reflect the requirements of the specific acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DOD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

Reference Paragraph	DID Number	DID Title	Suggested Tailoring
3.5	DI-E-7031	Drawings, engineering and associated lists	Level 3
4.4.1	DI-T-5329	Inspection and test reports	

The above DIDs were those cleared as of the date of this specification. The current issue of DOD 5010. 12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DIDs are cited on the DD Form 1423.

6.4 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 that have been cleared and listed in DOD 5010. 12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be listed on a separate Contract Data Requirements List (DD Form 1423), which is included as an exhibit to the contract. The technical manuals must be acquired under separate contract line item in the contract.

6.5 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List No. QPL-1 7501 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 and information pertaining to qualification of products may be obtained from that activity. Application for qualification tests shall be made in accordance with "Provisions Governing Qualification SD-6" (see 6.5. 1).

6.5.1 Copies of "Provisions Governing Qualification SD-6" may be obtained upon application to Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia. PA 19120.

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6.6 Provisioning. Provisioning Technical Documentation (PTD), spare parts, and repair parts should be furnished as specified in the contract.

6.6.1 When ordering spare parts or repair parts for the equipment covered by this specification, the contract should state that such spare parts and repair parts should meet the same requirements and quality assurance provisions as the parts used in the manufacture of the equipment. Packaging for such parts should also be specified.

6.7 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.

6.8 Subject term (key word) listing.

Diaphragms

O-rings

Seat rings

Silver brazing union connections

Three-way control, four port

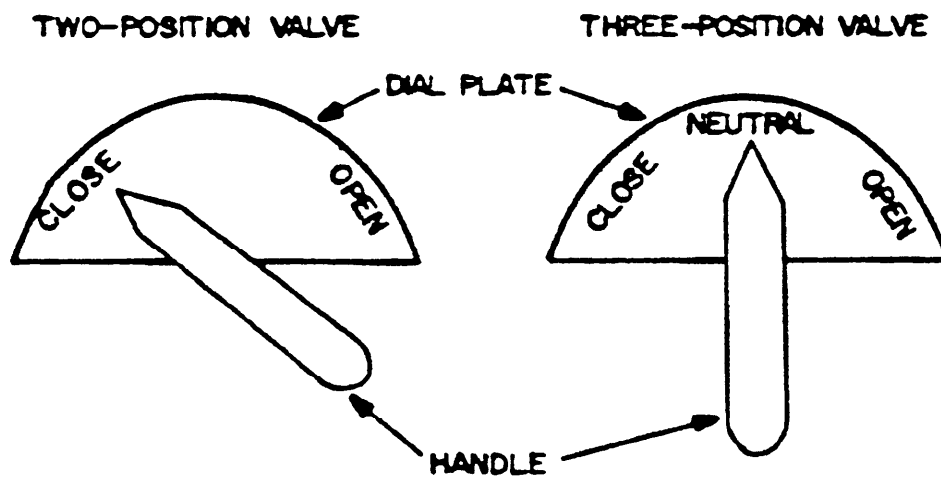
6.9 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Preparing activity:

Navy - SH

(Project 4810-N067)

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SH 13203108

FIGURE 1. *Type II valve dial plate.*

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

- 1 The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
- 2 The submitter of this form must complete blocks 4, 5, 6, and 7.
- 3 The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:		1. DOCUMENT NUMBER MIL-V-17501F(SH)	2. DOCUMENT DATE (YYMMDD) 29 October 1990
3. DOCUMENT TITLE VALVES, CONTROL TYPE, MAGAZINE, AND HANGAR DECK SPRINKLER			
4. NATURE OF CHANGE (Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)			
5. REASON FOR RECOMMENDATION			
6. SUBMITTER			
a. NAME (Last, First, Middle Initial)		b. ORGANIZATION	
c. ADDRESS (Include Zip Code)		d. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON (if applicable)	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY			
a. NAME Technical Point of Contact(TOP): Mr. Bruce Mason (SEA 56Y51)		b. TELEPHONE (Include Area Code) (1) Commercial (2) AUTOVON	
c. ADDRESS (Include Zip Code) Commander, Naval Sea Systems Command Department of the Navy (SEA 55Z3) Washington, DC 20362-5101		TPOC: 703-602-5935 332-5935	
PLEASE ADDRESS ALL CORRESPONDENCE AS FOLLOWS:		IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT:	
		Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	