



Standard Specification for Sliding Watertight Door Control Systems¹

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1. Scope

1.1 This specification covers the design, manufacture, and testing of controls and operating mechanisms for use with sliding watertight doors meeting the requirements of Specification F 1196.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:

A 312/A 312M Specification for Seamless and Welded Austenitic Stainless Steel Pipes²

F 1196 Specification for Sliding Watertight Door Assemblies³

2.2 Institute of Electrical and Electronic Engineers Standards:⁴

IEEE 45 Recommended Practice for Electrical Installations on Shipboard

IEEE 100 IEEE Standard Dictionary of Electrical and Electronic Terms

2.3 Society of Automotive Engineers Standards:⁵

J524 Seamless Low Carbon Steel Tubing Annealed for Bending and Flaring

J525 Welded and Cold Drawn Low Carbon Steel Tubing Annealed for Bending and Flaring

2.4 Military Specification:

MIL-S-901 Shock Test, H.I. (High Impact); Shipboard Machinery, Equipment and Systems, Requirements for⁶

2.5 American Society of Mechanical Engineers:

Section VIII, Division 1, ASME Boiler and Pressure Vessel Code, Pressure Vessels⁷

2.6 National Electrical Manufacturers' Association:⁸

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3. Terminology

3.1 Definitions:

3.1.1 *control station*—a location from which a sliding watertight door may be closed.

3.1.2 *door control*—the device that must be physically activated by the operator to initiate the opening or closing of a sliding watertight door.

3.1.3 *door control system*—the system of components necessary to operate a sliding watertight door, consisting of the door control, operating mechanism, and interconnecting components.

3.1.4 *electrical control voltage*—the voltage applied to the door controls, indicators, and alarms.

3.1.5 *electrical system voltage*—the voltage generated by the electrical power sources at which the operating mechanism will operate.

3.1.6 *interconnecting components*—those components between the door control and the operating mechanism necessary to cause the operating mechanism to move a sliding watertight door as directed by the door control or between the door and the remote indicator. Interconnecting components form a mechanical, hydraulic, or electrical system between the control station and the door and between the door and the remote indicator.

3.1.7 *local control station*—a location adjacent to a sliding watertight door from which the door may be opened or closed.

3.1.8 *manual control*—a door control that requires the operator to apply a continuous cyclic force, for example, the turning of a handwheel or operating of a pump handle, to cause the operating mechanism to function.

3.1.9 *operating mechanism*—the device, be it mechanical, electric, or hydraulic, that directly causes a physical force to be placed upon a sliding watertight door to cause its movement.

power control—a door control that requires the operator to exert a minimal physical force, for example, pushing of a button, flipping of a switch, or holding of a lever, to cause the operating mechanism to function.

3.1.10 *remote control station*—a location from which a door or doors can be remotely closed.

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² *Annual Book of ASTM Standards*, Vol 01.01.

³ *Annual Book of ASTM Standards*, Vol 01.07.

⁴ Available from Institute of Electrical and Electronics Engineers, 445 Hoes Lane, PO Box 1331, Piscataway, NJ 08855-1331.

⁵ Available from Society of Automotive Engineers, Inc., 400 Commonwealth Dr., Warrendale, PA 15096-0001.

⁶ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

⁷ Available from American Society of Mechanical Engineers, Headquarters, Three Park Ave., New York, NY 10016-5900.

⁸ Available from National Electrical Manufacturers' Association, 1300 N. 17th St., Suite 1847, Rosslyn, VA 22209.

3.1.11 *remote indicator*—the device, mechanical or electric, located at a remote control station that indicates whether a door is open, closed, or at an intermediate position.

4. Classification

4.1 Sliding watertight door control systems are of the following types:

4.1.1 *Manual*—a door control system that requires the operator to apply a continuous cyclic force to the door controller to cause the operating mechanism to function. Manual control systems consist of the following types:

4.1.1.1 *Mechanical*—An operating system, such as that consisting of a handwheel, shafting, gears, universal joints, and a rack and pinion assembly.

4.1.1.2 *Hydraulic*—A system consisting of a hand pump, fluid power cylinder, and interconnecting pipe, tubing, valves, and fittings.

4.1.2 *Power*—A door control system that requires only that the operator exert a minimal physical force to cause the operating mechanism to function. Power control systems consist of the following types:

4.1.2.1 *Electric*—A system consisting of a pushbutton, switch, or lever that activates, through an electric circuit, an electric motor that drives a rack and pinion operating mechanism that applies the necessary force to open and close the door.

4.1.2.2 *Hydraulic*—A system consisting of a lever-operated control valve, hydraulic accumulator, and interconnected pipe, tubing, valves, and fittings that actuates a fluid power cylinder operating mechanism that applies the necessary force to open and close the door.

4.1.2.3 *Electrohydraulic*—A system consisting of a combination of electric and hydraulic components, whereby a pushbutton, switch, or lever, through an electric circuit, activates an electric motor that drives a hydraulic pump that supplies hydraulic fluid under pressure to an operating mechanism consisting of a fluid power cylinder that applies the necessary force to open and close the door.

5. Ordering Information

5.1 Specify the following information when ordering:

- 5.1.1 Quantity,
- 5.1.2 Door type,
- 5.1.3 Door class,
- 5.1.4 Opening hand,
- 5.1.5 Door size,
- 5.1.6 Design pressure head of door,
- 5.1.7 Type of control system,
- 5.1.8 Electrical system voltage,
- 5.1.9 Electrical control voltage,
- 5.1.10 Distance from the door to remote control stations,
- 5.1.11 Remote control panel requirements (if applicable),
- 5.1.12 Supplementary requirements (if any),
- 5.1.13 Additional requirements as contracted by the manufacturer and purchaser, and
- 5.1.14 ASTM specification designation.

6. Materials and Manufacture

6.1 Cast iron components shall not be used unless shock

tested and approved in accordance with MIL-S-901.

7. Design of Manual Operating Controls

7.1 All sliding watertight doors shall be provided with a means of local and remote manual operation.

7.2 The maximum force required to operate each manual control shall be 25 lbs (11 kg), except that a maximum force of 50 lbs (23 kg) is acceptable during wedging if applicable.

7.2.1 Hand pumps may operate with an all around crank motion or a reciprocating motion.

7.2.2 Handwheels shall be at least 18 in. (457 mm) in diameter.

7.3 Manual controls shall remain stationary when the door is operated by other means.

7.4 Local Manual Controls:

7.4.1 Local manual controls shall be capable of opening and closing each door from both sides of the bulkhead.

7.4.2 Local manual controls shall be located within 10 ft (3 m) of, and in visual contact with, the door.

7.4.3 Local manual controls shall always operate, even in the event of rupture of hydraulic lines more than 10 ft (3 m) from the door.

7.5 Remote Manual Controls:

7.5.1 A remote manual control shall be provided above the bulkhead deck to close each door remotely.

7.5.1.1 It shall not be possible to open a door remotely.

7.5.2 An indicator, mechanically connected to the door, shall be located at the remote manual control station to indicate whether the door is open or closed.

8. Design of Power Operating Controls

8.1 Each Class 3 door, as defined in Specification F 1196, shall be provided with local power controls for opening and closing the door and remote power controls for closing the door. Door control systems intended for installation aboard Coast Guard inspected and certificated vessels shall comply with Supplementary Requirements S1 through S4 in addition to the following.

8.1.1 Local Power Controls:

8.1.1.1 Local power controls shall be so located that they may be held in the open position by a person passing through the doorway.

8.1.1.2 The controls shall be at least 48 in. (122 cm) above the deck.

8.1.1.3 The direction of movement of handles used to open and close the door shall be in the direction of the door movement.

8.1.2 Remote Power Controls:

8.1.2.1 Remote power controls shall be located on a central control station located on the navigating bridge.

8.1.2.2 The central control station shall have a “master mode” switch with two modes of control. (1) The “local control” mode shall allow any door to be locally opened and locally closed after use without automatic closure of the door. (2) The “doors closed” mode shall automatically close any door that is open. While permitting doors to be opened locally, either by power or hand, doors shall automatically reclose upon release of the local control mechanism whenever the “doors closed” mode is activated.