



DELUGE VALVES, HORIZONTAL - 4 & 6 INCH

MODEL A-4 MULTIMATIC®

GENERAL DESCRIPTION

The Model A-4 Multimatic Valve is a deluge type valve designed for use in fire protection systems where a deluge application of water is required. It is used as the system control valve in deluge, pre-action, and special types of fire protection systems and to provide for actuation of fire alarms when the systems operate.

The Multimatic Valves are rated for use at a maximum service pressure of 175 psi and are available in 4 and 6 inch sizes. They have flanged inlet and outlet connections per ANSI Standard B16.1.

Basic Trim for the valve provides materials for the diaphragm chamber supply, drain, and gauge connections. A manual control station for local actuation of the valve is also included.

Actuation Trim and devices for automatic fixed temperature or rate of temperature rise actuation of the valve and for remote manual actuation are ordered separately. Alarm Trim and accessories for hydraulic and/or electric alarms and for the start-up or shut-down of electrical equipment are also ordered separately.

APPROVALS AND STANDARDS

The Model A-4 Multimatic Valves are listed by Underwriters Laboratories Inc. and Underwriters' Laboratories of Canada. The valves are approved by Factory Mutual Research Corporation, the Fire Offices' Committee, the Assemblée Plénier, and by the New York City Board of Standards and Appeals under Calendar Number 236-79-SA.

WARNING

The Model A-4 Multimatic Valve described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the integrity of this device.

The owner is responsible for maintaining his fire protection system and devices in proper operating condition. The installing contractor or manufacturer should be contacted relative to any questions.

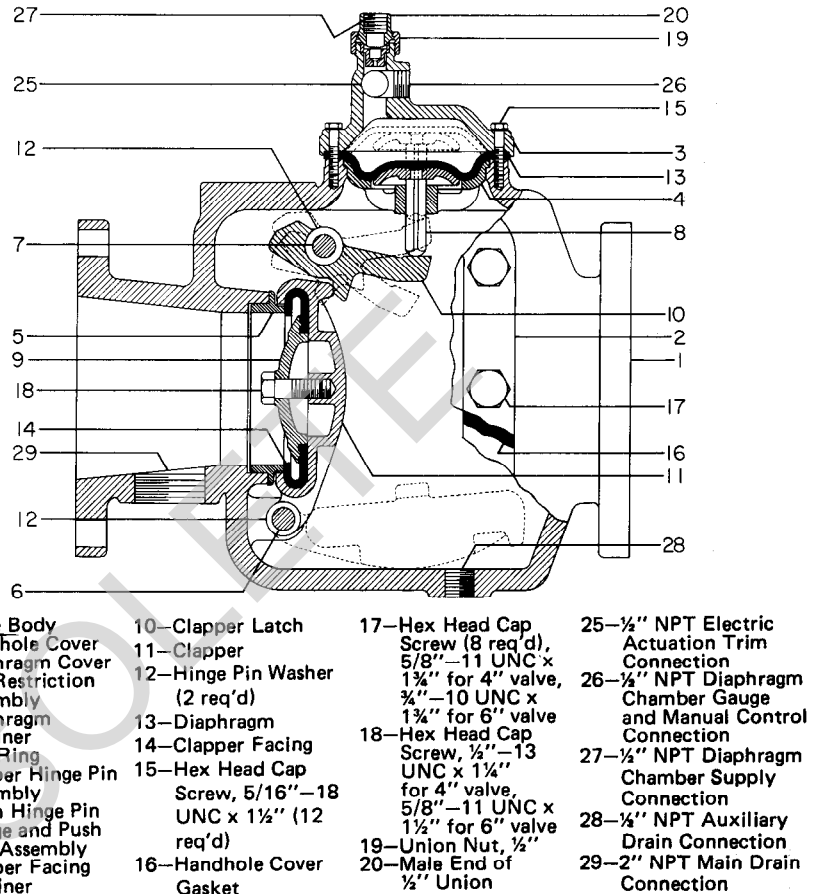


FIGURE A
MODEL A-4 MULTIMATIC VALVE (HORIZONTAL ORIENTATION)

DESIGN (Fig. A)

Principal components of the Multimatic Valve are the Body, Diaphragm and Clapper Assemblies and the Clapper Latch.

Body Assembly. The Body (1) is cast with integral flanges faced and drilled in compliance with ANSI Standard B-16.1. There are three female NPT Connections in the Body for mounting alarm trimmings, auxiliary and main drains. A Seat Ring (5) is permanently mounted in the throat of the Body.

The Handhole Cover (2) and Gasket (16) are held in position with Cap Screws (17). The Handhole Cover Pin (not shown), mounted in the back of the Cover near the left side edge, seats in the opening of a channel that extends to the throat of the Body.

On the face of the Handhole Cover

there is an Identification Label on which is printed the year the valve was manufactured. Other markings are cast on the Cover in raised print and a serial number is stamped on the front edge of the discharge flange. With exception of the Identification Label, all exterior surfaces of the Body and Handhole Cover are painted red.

Diaphragm Assembly. The Diaphragm Assembly, consisting of the Diaphragm (13), Diaphragm Retainer (4), Flange and Push Rod Assembly (8) and the Diaphragm Cover and Restriction Assembly (3), is mounted on the top of the Body with Hex Head Cap Screws (15).

The Diaphragm Cover has four female NPT connections for mounting the Basic and Actuation Trimmings. The Diaphragm Chamber Supply Connection (27) has a 1/8 inch restriction.

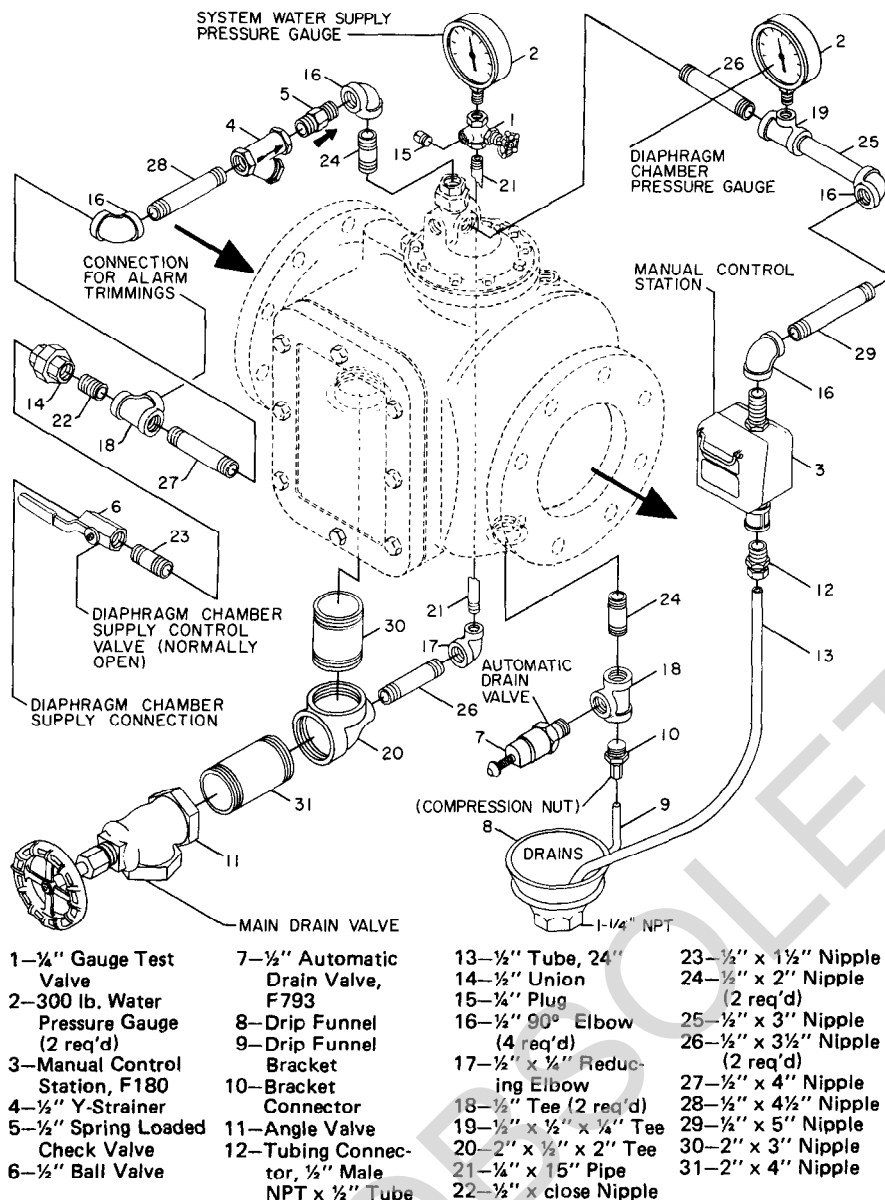


FIGURE B
MODEL A-4 MULTIMATIC VALVE BASIC HORIZONTAL TRIM

Clapper Assembly. The Clapper Assembly consists of the Clapper (11), Clapper Facing (14), Clapper Facing Retainer (9) and a Hex Head Cap Screw (18). The Assembly is mounted in the Body with the Clapper Hinge Pin (6) and Hinge Pin Washer (12).

Clapper Latch. The Clapper Latch (10), mounted in the Body with the Latch Hinge Pin (7) and Hinge Pin Washer (12), is the mechanical linkage between the Clapper and Diaphragm Assemblies.

OPERATION

The Multimatic Valve is a differential type valve which depends upon water pressure in the Diaphragm Chamber to

hold the Clapper closed against the water supply pressure. The valve has a nominal trip ratio of 2.5 to 1, i.e., the valve operates when pressure in the Diaphragm Chamber is reduced to approximately two fifths of the water supply pressure.

Operation of an actuation device releases water from the Diaphragm Chamber at a rate faster than it can be replenished through the restriction in the Diaphragm Cover (3—Fig. A). This results in a rapid pressure drop in the Diaphragm Chamber and the differential between the Diaphragm Chamber pressure and the water supply pressure is destroyed. The water supply pressure then forces

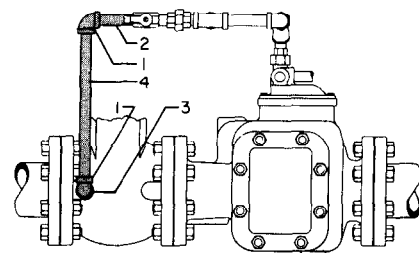
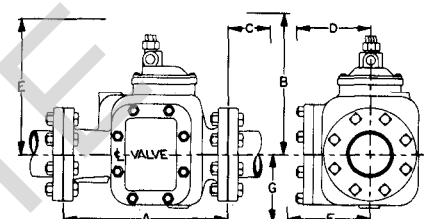


FIGURE C
DIAPHRAGM CHAMBER SUPPLY CONNECTION



Dimension	4"/100 mm Valve	6"/150 mm Valve
A—Face to Face of Valve Flanges	16.00" (406)	18.00" (457)
B—To Top of Pressure Gauge	15.25" (387)	16.00" (406)
C—To Outside of Pressure Gauge	6.25" (159)	5.50" (140)
D—To Front of Diaphragm Supply Connections	11.00" (279)	11.00" (279)
E—To Top of Diaphragm Supply Connections	14.75" (375)	15.50" (394)
F—To Front of Drain Valve	16.75" (425)	16.75" (425)
G—To Bottom of Drip Cup	14.50" (368)	18.00" (457)

Dimensions shown in parenthesis are in millimeters.

FIGURE D
INSTALLATION AND CLEARANCE DIMENSIONS

the Clapper (11—Fig. A) open permitting a flow of water to the system piping. Water flowing through the Alarm Connection in the valve actuates the system alarms.

When the valve is set for service, the Diaphragm Chamber is pressurized through the connections from the inlet side of the system's Main Control Valve. Actuation of the valve can be one or more of the following releasing devices; manual control station (local or remote), solenoid valve, dry pilot, wet pilot, or Protomatic Release. Solenoid valve release is only to be via an automatic control unit which is listed or approved (as appropriate) for fire protection system releasing service.

PRESSURE LOSS

The pressure loss resulting from friction generated by water flowing through the Multimatic Valve is expressed in terms of equivalent feet of pipe — 13 feet of 4 inch pipe for the 4 inch valve and 23 feet of 6 inch pipe for the 6 inch valve.

INSTALLATION (Fig. B)

The Model A-4 Multimatic Valve and associated trim must be maintained at a minimum temperature of 40F/4C.

NOTE

Heat tracing of the valve or its associated trim is not permitted. Heat tracing can result in the formation of hardened mineral deposits which are capable of preventing proper operation of the valve. Heat tracing can also result in damage to the Diaphragm Assembly.

Basic Trim and Bill of Materials, suitable for use with either the 4 or 6 inch valve, are shown in Figure B.

Basic Trim must be installed as shown in Figure B. The supply connection to the Diaphragm Chamber must always be made from the inlet side of the system's Main Control Valve. If the Control Valve is directly below the Multimatic Valve, complete the connection as shown in Figure C. If the Control Valve is located remote from the Multimatic Valve, complete the connection by piping from the Union (20) in the Basic Trim to the inlet side of the Control Valve.

In addition to the Basic Trim and the Diaphragm Chamber Supply Connection, other trim and attachments to the Multimatic Valve may include one or more of the following:

- Horizontal Electric Actuation Trim No. 2 (Technical Data Sheet TD117P)
- Horizontal Dry Pilot Actuation Trim No. 6 (Technical Data Sheet TD117Q)
- Horizontal Alarm and Test Trim No. 5 (Technical Data Sheet TD117T)
- Wet Pilot Actuation Trim (Technical Data Sheet TD117V)
- Protomatic Release (Protomatic Data Book)
- Manual Control Stations (Technical Data Sheet TD121)

Dimensions of the Multimatic Valve and clearances which should be allowed for the Basic Trim are shown in Figure D.

Discharge from the Main Drain Valve (11) and from the Drip Funnel (8)

should be piped to a suitable receiver or through the building wall above the snow line and where discharging water will cause no damage. The drains can be interconnected provided a check valve is installed to prevent a back-flow through the Drip Funnel.

Before installation of trim and devices, all pipe, nipples, and fittings must be clean and free of scale and burrs. Use pipe joint compound sparingly on male threads only.

RESETTING

After the Multimatic Valve has operated, the Clapper (11—Fig. A) will not automatically reset. The valve must then be reset and the system restored to service as soon as possible. The procedure is as follows:

1. Close the Diaphragm Chamber Supply Control Valve (Fig. B).
2. Close the system's Main Control Valve.
3. Restore the actuation devices to service in accordance with their associated instructions.
4. If the valve was actuated by operation of the Manual Control Station (3—Fig. B), push the operating lever up. Do not close the hinged cover at this time.
5. Open the Main Drain Valve (Fig. B) and all auxiliary drains in the system. Close the auxiliary drains when water ceases to discharge; leave the Main Drain Valve open.
6. Push the plunger of the Automatic Drain Valve (7—Fig. B) to be sure it is open and that the Multimatic Valve has drained.
7. Remove the Handhole Cover (Fig. A) and thoroughly clean all interior parts of the valve. Make certain the pressure equalizing vents in the Clapper (11—Fig. A) are open and that all parts are free of rust and scale. Test the Clapper, Clapper Latch (10—Fig. A) and the Flange and Push Rod Assembly (8—Fig. A) for freedom of movement.
8. Inspect the Clapper Facing for any sign of deterioration due to age or chemicals in the water.
9. Pivot the Clapper Latch to allow the Clapper to be resealed. After reseating the Clapper, release the Latch so that it resets on the boss on the edge of the Clapper.
10. Open the Diaphragm Chamber Supply Control Valve (Fig. B) and allow time for full pressure to build up in the Diaphragm Chamber.
11. If wet pilot actuation is being used, crack open the Inspector's Test Connection and any vent valves, to relieve trapped air. After the discharge of air has stopped, close the vent valves and the Inspector's Test Connection.
12. Operate (open) the Manual Control Station (3—Fig. B). If necessary, first open the hinged cover, and then pull full down on the operating lever. SLOWLY close the operating lever, by pushing it up, after aerated water ceases to discharge from the drain tubing. Close the hinged cover and insert a new break rod in the small hole through the top of the enclosing box.
13. Inspect drain connections from the Manual Control Station, Actuation Trim, and Alarm Trim for leaks. Particular attention should be given to the Protomatic Release, if the system is so equipped. Leaks, if any, must be corrected before the system is restored to service.
14. Replace the Handhole Cover and Gasket. Be sure the pin in the back of the Cover and the small hole in the Handhole Cover Gasket are properly oriented with the small orifice near the left edge of the handhole. Water will discharge through this orifice if the Handhole Cover is not properly secured in place when the Main Control Valve is opened. Tighten all Cap Screws uniformly using a cross-draw sequence.
15. Slowly open the Main Control Valve. Close the Main Drain Valve as soon as water discharges from the drain connection. Observe the Automatic Drain Valve (7—Fig. B) for leaks. If there are leaks, either the Clapper is not properly seated and the valve must be reset, or there is internal leakage past the Clapper Facing or Diaphragm. Determine/correct the cause of the leakage problem. If there are no leaks, the valve is ready to be placed in service and the Main Control Valve must be fully opened.



DELUGE VALVE, HORIZONTAL, MODEL A-4 MULTIMATIC®

OBSOLETE

CARE AND MAINTENANCE

It is recommended that periodic inspections and tests be conducted to be sure the Multimatic Valve and related equipment are in good operating condition. Inspection and test procedures applicable to actuation and alarm devices are detailed in separate instructions. The following instructions apply to the Multimatic Valve and Basic Trim.

NOTES

Before closing a fire protection system main control valve for maintenance work on the fire protection system which it controls, permission to shut down the affected fire protection system must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

Before testing alarms, notification must be given to the owner and the fire department, central station or other signal station to which the alarms are connected.

It is recommended that the following wet (i.e., supply pressurized) trip test procedure be performed at least annually by a qualified Inspection Service.

1. If water must be prevented from flowing beyond the riser, perform the following steps:
 - a. Close the Main Control Valve.
 - b. Open the Main Drain Valve.
 - c. Open the Main Control Valve one turn beyond the position at which water just begins to flow from the Main Drain.
 - d. Close the Main Drain Valve.
2. Determine the type of actuation/detection system being used with the Multimatic Valve, and operate the Multimatic Valve accordingly. Record the pressure reading on the Diaphragm Pressure Gauge at the trip point of the Multimatic Valve.

NOTE

Be prepared to quickly perform Steps 3 and 4, if water must be prevented from flowing beyond the riser.

Wet Pilot Actuation - open the Inspector's Test Connection.

Dry Pilot Actuation - open the Inspector's Test Connection.

Electric Actuation - energize the

solenoid valve by operating the electric control unit.

Protomatic Release - perform a System Response Test in accordance with the instructions given in the Protomatic Data Book.

3. Close the Diaphragm Chamber Supply Control Valve.
4. Close the system's Main Control Valve.
5. Clean, inspect, and reset the Multimatic Valve in accordance with Resetting Instructions 3 through 15.

It is recommended that the Diaphragm Cover and Restriction Assembly be removed at least every 5 years and the Diaphragm inspected, by a qualified Inspection Service. The Diaphragm should be replaced if there is any sign of deterioration due to age or chemicals in the water. If the water supply contains chemicals which tend to attack an EPDM type rubber, then the frequency of Diaphragm inspection should be increased to at least annually.

WARRANTY

Seller warrants for a period of one year from the date of shipment (warranty period) that the products furnished hereunder will be free from defects in material and workmanship.

For further details on Warranty, see Price List.

ORDERING PROCEDURE

All orders for the Model A-4 Multimatic Valve, trim, accessories, and replacement parts must reference the Product Symbol Number (PSN) for the item required.

Valve:

Specify: (size) inch Horizontal Model A-4 Multimatic Valve, PSN (specify).

4" PSN 52-404-1-113
6" PSN 52-404-1-115

Basic Trim:

Specify: Horizontal Basic Trim No. 1 for Model A-4 Multimatic Valve, PSN 52-304-1-101.

Order Separately As Required:

Electric Actuation Trim (for fixed temperature or rate of temperature rise actuation); refer to Technical Data Sheet TD117P.

Dry Pilot Actuation Trim (for fixed temperature actuation); refer to Technical Data Sheet TD117Q.

Wet Pilot Actuation (for fixed temperature actuation); refer to Technical Data Sheet TD117V.

Protomatic Release (for pneumatic rate of temperature rise actuation); refer to Protomatic Data Book.

Alarm and Test Trim; refer to Technical Data Sheet TD117T.

Manual Control Station (for remote use); refer to Technical Data Sheet TD121.

Order materials for the Diaphragm Chamber Supply Connection, in accordance with Figure C, if the main control valve is installed directly below the Multimatic Valve. If the control valve is to be installed in any other position, separately order ½" minimum size pipe and fittings, as required.

Replacement Parts

To order replacement parts, specify: (description) for use with (size specify) Model A-4 Multimatic Valve, PSN (specify).

4"/100 mm Multimatic Valve (Fig. A)

- 2—Handhole Cover . . . PSN 92-404-1-002
- 3—Diaphragm Cover and Restriction Assembly† . . . PSN 92-404-1-042
- 4—Diaphragm Retainer for Valves with Serial Number; —up to 2708-1983 PSN 92-404-1-027
- 2709-1983 and higher PSN 92-404-1-049
- 6—Clapper Hinge Pin Assembly . . . PSN 92-404-1-038
- 7—Latch Hinge Pin PSN 92-404-1-023
- 8—Flange and Push Rod Assembly PSN 92-404-1-040
- 9—Clapper Facing Retainer PSN 92-404-1-004
- 10—Clapper Latch PSN 92-404-1-005
- 11—Clapper PSN 92-404-1-006
- 12—Hinge Pin Washer PSN 92-404-1-037
- 13—Diaphragm PSN 92-404-1-031
- 14—Clapper Facing PSN 92-404-1-009
- 16—Handhole Cover Gasket PSN 92-404-1-008
- Clapper Assembly PSN 92-404-1-011
- ½" Union† PSN 16-418-1-004

† Orders for a replacement Diaphragm Cover & Restriction Assembly or a ½" Union for Model A-4 Multimatic Valves manufactured up thru 1977 will require replacement of both parts.

6"/150 mm Multimatic Valve (Fig. A)

- 2—Handhole Cover . . . PSN 92-404-1-021
- 3—Diaphragm Cover and Restriction Assembly† . . . PSN 92-404-1-042
- 4—Diaphragm Retainer for Valves with Serial Number;—up to 2708-1983 . . . PSN 92-404-1-027—2709-1983 and higher . . . PSN 92-404-1-049
- 6—Clapper Hinge Pin Assembly . . . PSN 92-404-1-038
- 7—Latch Hinge Pin . . . PSN 92-404-1-023
- 8—Flange and Push Rod Assembly. . . . PSN 92-404-1-040
- 9—Clapper Facing Retainer PSN 92-404-1-026
- 10—Clapper Latch . . . PSN 92-404-1-030
- 11—Clapper PSN 92-404-1-025
- 12—Hinge Pin Washer PSN 92-404-1-037
- 13—Diaphragm PSN 92-404-1-031
- 14—Clapper Facing. . . PSN 92-404-1-032
- 16—Handhole Cover Gasket PSN 92-404-1-033—Clapper Assembly. . . . PSN 92-404-1-048—½" Union† . . . PSN 16-418-1-004

† Orders for a replacement Diaphragm Cover & Restriction Assembly or a ½" Union for Model A-4 Multimatic Valves manufactured up thru 1977 will require replacement of both parts.

The Clapper Assembly listed in the preceding valve replacement parts lists consists of Items 9, 11, 14 and 18 listed in Figure A. The ½" Union consists of Items 19 and 20 shown in Figure A (the Union - Female End is to be discarded).

Items 15, 17 and 18 listed in Figure A are common hardware items and are to be obtained locally. Items 1 and 5 are not replaceable and thus are not in the valve replacement parts lists. All other items listed in Figure A are available.

Basic Trimmings (Fig. B)

- 1—½" Gauge Test Valve . . . PSN 46-005-1-002
- 2—300 lb. Water Pressure Gauge . . . PSN 92-343-1-005
- 3—Manual Control Station . . . PSN 52-289-1-001
- 4—½" Y-Strainer . . . PSN 52-353-1-005
- 5—½" Spring Loaded Check Valve . . . PSN 92-322-1-002
- 6—½" Ball Valve . . . PSN 46-050-1-004
- 7—½" Automatic Drain Valve, F793*. . . PSN 52-793-1-004
- 8—Drip Funnel . . . PSN 92-343-1-007
- 9—Drip Funnel Bracket. . . . PSN 92-211-1-003
- 10—Bracket Connector . . . PSN 92-211-1-005
- 11—2" Angle Valve PSN 46-048-1-009

*Model A-4 Multimatic Valves prior to Serial Number 8808-84 utilized a 1" Fig. 1686 Automatic Drain Valve. The ½" F793 Automatic Drain Valve is a direct replacement; however, a 1" x ½" bushing is required for installation of the F793 in a valve having a serial number less than 8800-1984.

Items listed in Figure B but not included in the preceding replacement parts list are common hardware items and are to be obtained locally.

CONVERSION FACTORS

Parenthetical metric conversions cited herein are approximate.

1 inch	=	25.400 mm
1 pound	=	0.4536 kg
1 psi	=	6.895 kPa
	=	0.0689 bar*
	=	0.0703 kg/cm ² *
1 U.S. gallon	=	3.785 dm ³
	=	3.785 liters*

*Not recognized International System units.

WEIGHTS

The nominal weights of the Model A-4 Multimatic Valves are:

4"	146 pounds
6"	234 pounds