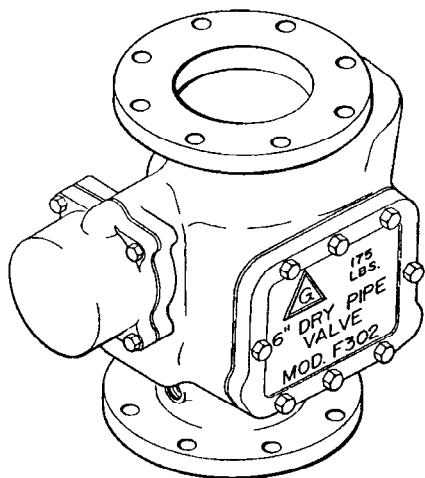




DRY PIPE VALVE — 4 and 6 INCH (100 and 150 mm)

MODEL F302 (FLANGE x FLANGE) & F3021 (FLANGE x GROOVE)

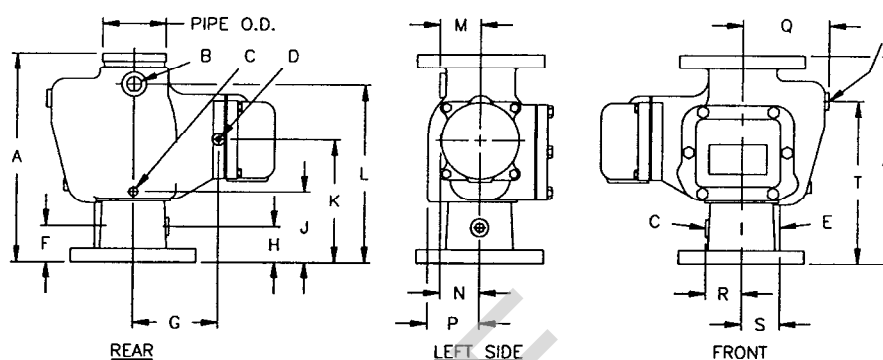


GENERAL DESCRIPTION

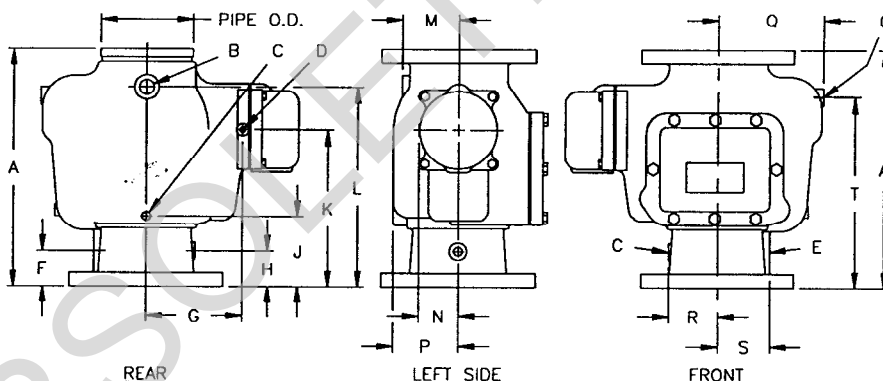
The 4 and 6 inch (100 and 150 mm), Model F302 and F3021 Dry Pipe Valves are differential, latch type valves used to automatically control the flow of water into dry pipe fire protection sprinkler systems upon operation of one or more automatic sprinklers. The F302 and F3021 also provide for actuation of fire alarms upon system operation.

Both model valves have flanged inlet connections and are identical with the exception of the outlet connection. The Model F302 has a flanged outlet connection, whereas the Model F3021 has a grooved outlet connection.

Dry pipe sprinkler systems are typically used in unheated warehouses, parking garages, store windows, attic spaces, loading docks, and similar areas exposed to freezing temperatures, where water filled pipe cannot be utilized. When set for service, a dry pipe sprinkler system is pressurized with air (or nitrogen), and the loss of air pressure through an operated automatic sprinkler, in response to heat from a fire, permits the dry pipe valve to open and allow a flow of water into the sprinkler system piping. The differential design of the F302/F3021 is such that the minimum air pressure in the piping is approximately one-sixth of the static water supply pressure, with an added 20 psi (1,4 bar) safety factor, to help prevent a false operation that might otherwise occur due to water supply pressure fluctuations.



4 Inch (100 mm) Valve



6 Inch (150 mm) Valve

Nominal Dimensions in Inches and (mm)

VALVE SIZE	A	B	C	D	E	F	G	H
4 (100)	15 (381,0)	1" NPT	1/2" NPT	1/4" NPT	2" NPT	2.56 (65,0)	6.88 (174,8)	2.56 (65,0)
6 (150)	17 (431,8)	1" NPT	1/2" NPT	1/4" NPT	2 NPT	2.56 (65,0)	6.06 (153,9)	2.50 (63,5)

VALVE SIZE	J	K	L	M	N	P	Q	R
4 (100)	5.06 (128,5)	11.25 (285,8)	14.25 (362,0)	4.00 (101,6)	2.75 (69,9)	4.12 (104,7)	7.62 (193,6)	3.50 (88,9)
6 (150)	5.00 (127,0)	8.75 (222,3)	12.75 (323,9)	2.88 (73,3)	2.75 (69,9)	3.25 (82,6)	6.25 (158,8)	2.56 (65,0)

VALVE SIZE	S	T	PIPE O.D.
4 (100)	3.75 (95,3)	13.62 (346,0)	4.50 (114,3)
6 (150)	2.75 (69,9)	11.69 (297,0)	6.62 (168,2)

FIGURE A
MODEL F302/F3021 DRY PIPE VALVES
— DIMENSIONS AND PORT LOCATIONS —

APPROVALS AND STANDARDS

The 4 and 6 inch (100 and 150 mm), Model F302 and F3021 Dry Pipe Valves are listed by Underwriters Laboratories Inc. and Underwriters Laboratories of Canada. They are also approved by the Factory Mutual Research Corporation, the Scientific Services Laboratory (Australia), and by the New York City Board of Standards and Appeals under Calendar Number 236-79-SA.

The Model F302 and F3021 Dry Pipe Valves with galvanized trim are approved by the Loss Prevention Council (United Kingdom).

Inquiries concerning approval by the Verband der Schadeversicherer should be directed to Grinnell Sales & Distribution, Kopersteden 1, NL-7547 TJ Enschede, Netherlands, Tel. 31-534-283-434 / Fax. 31-534-283-377.

WARNING

The Model F302 and F3021 Dry Pipe Valves 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 these devices.

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

TECHNICAL DATA

Dry Pipe Valve:

The 4 and 6 inch (100 and 150 mm) Model F302/F3021 Dry Pipe Valves are rated for use at a maximum service pressure of 175 psi (12,1 bar). The Valve dimensions are shown in Figure A, and all of the ports are NPT threaded per ANSI Standard B1.20.1. "Standard order" flanged connections are drilled per ANSI specifications

shown in Table A, and on a "special order" basis flanged connections are available drilled per ISO specifications. The grooved outlet connection of the Model F3021 is cut in accordance with Gruvlok standard groove specifications for steel pipe, and it is suitable for use with grooved end pipe couplings that are listed or approved for fire protection system service.

The F302 and F3021 Valves are to be installed vertically, as shown in Figure A. Exterior surfaces of the Body and Covers are painted red. The year of manufacture and serial number are metal stamped on the edge of the inlet flange, and the year of manufacture also appears on the Handhole Cover.

The nominal pressure losses versus flow are shown in Graphs A-1 and A-2. The approximate friction losses, based on the Hazen and Williams formula and expressed in equivalent length of Schedule 40 pipe with C = 100, is 6.4 feet of 4 inch pipe for the 4 inch (100 mm) valve size and 9.6 feet of 6 inch pipe for the 6 inch (150 mm) valve size. The equivalent length of pipe has been calculated on the basis of the flow rates typically used with each size valve.

Components of the 4 and 6 inch (100 and 150 mm) Model F302/F3021 Dry Pipe Valves are shown in Figure B.

Valve Body, Covers, and Seat Rings.

The Body (1) is cast iron per ASTM A-48, Class 35B, and the Handhole Cover (30) and Auxiliary Clapper Cover (27) are cast iron per ASTM A126, Class B. The Handhole Cover Gasket (31) and Auxiliary Clapper Cover Gasket (29) are SBR with cotton fabric insert. The cover fasteners (28 & 38) are low carbon steel. The Seat Ring (2) is bronze per ASTM B62 (C83600). The Auxiliary Clapper Seat Ring (19) is Teflon coated bronze per ASTM B62 (C83600). Both Seat Rings are permanently press-fit within the Body. The Auxiliary Clapper Seat Ring utilizes an EPDM O-Ring (20) between the Seat Ring and Body, as well as a replaceable silicone O-Ring (32) within its internal bore.

Auxiliary Clapper Assembly. The Auxiliary Clapper Facing (22) and the Auxiliary Clapper Rod O-Ring (18) are

silicone rubber. The Auxiliary Clapper (23), and the Auxiliary Clapper Facing Retainer (21) are brass per ASTM B124 (C37700). The Auxiliary Clapper Rod (17), Push Rod Screw (16), and Push Rod Screw Locknut (36) are stainless steel per ASTM A581 (S30300). The Auxiliary Clapper Locknut (25) is brass per ASTM B16 (C36000), and the Auxiliary Clapper Spring (26) is stainless steel.

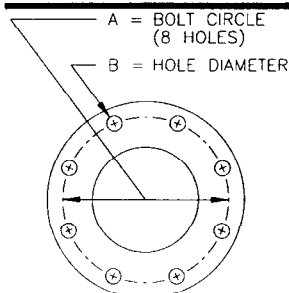
Waterway Clapper Assembly. The Clapper Facing (6) is EPDM. The Clapper Arm (34) is aluminum bronze per ASTM B148 (C95000), and the Clapper Cotter Pins (3) are phosphor bronze. The Clapper (7), as well as the Clapper Facing Retainer (5), are brass per ASTM B124 (C37700). The Lower and Upper Latches (8 & 11) are bronze per ASTM B62 (C83600). The Upper Latch Pin (13) is brass per ASTM B16 (C36000), and the Upper Latch Cotter Pins (39) are brass. The Lower and Upper Clapper Nuts (4 & 12) are brass per ASTM F467 (C27000, C46200, or C46400). The Clapper Arm Pin (33) is brass per ASTM B16 (C36600), and the Washers (9) are brass.

Mechanical Linkage. The Clapper Latch (14) is aluminum bronze per ASTM B148 (C95500), and the Washers (9) are brass. The Clapper Latch Pin (15) is brass per ASTM B16 (C36600).

Valve Trim:

Installation dimensions are given in Figures E-1 and E-2, and the Valve Trim is illustrated in Figure F. Figure F also illustrates which trim connections are factory assembled to ease field assembly. The Valve Trim forms a part of the laboratory listings and approval of the F302/F3021 Valves and is necessary for the proper operation of the F302/F3021 Valves. Each package of trim includes the following items:

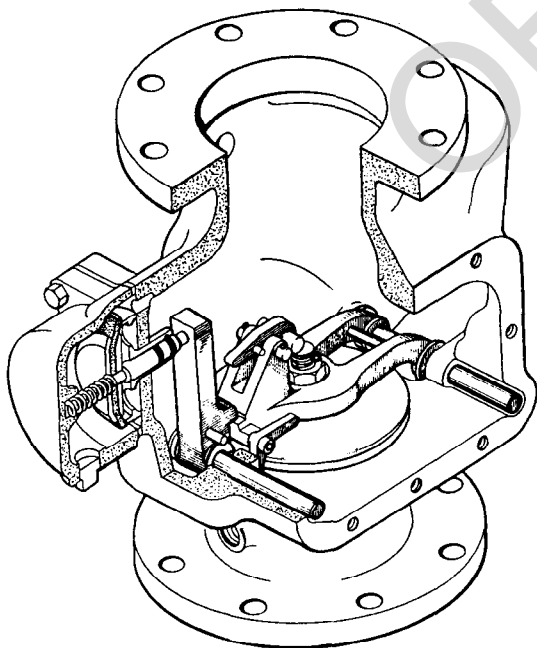
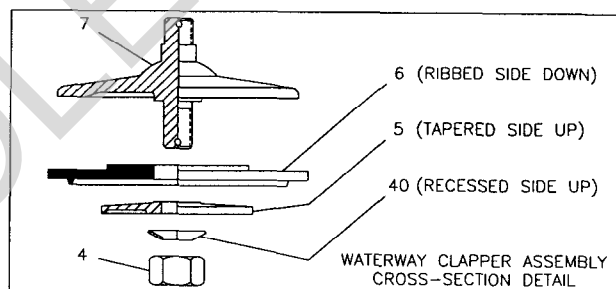
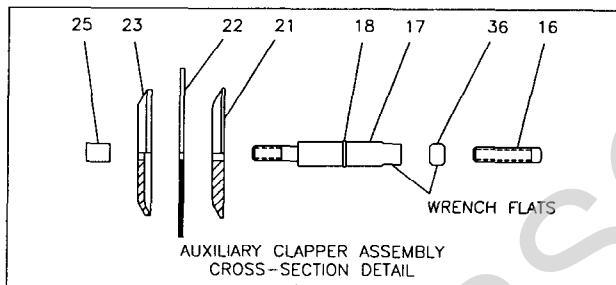
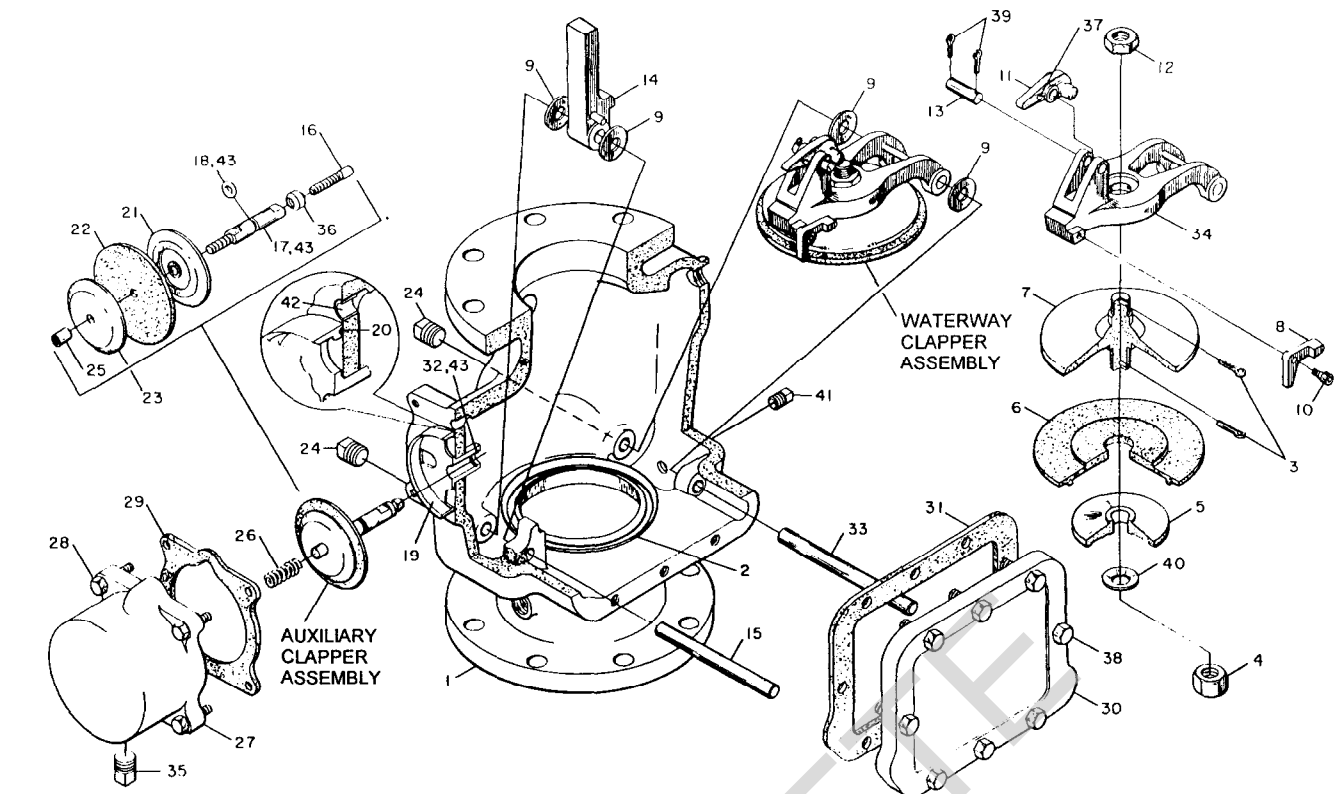
- Water Supply Pressure Gauge
- System Air Pressure Gauge
- Air Supply Connections
- Main Drain Valve
- Alarm Test Valve
- Alarm Control Valve
- Automatic Drain Valve
- Priming Cup
- Priming Level Test Valve
- Drip Funnel



	Nominal Dimensions in Inches and (mm)			
	4" (100 mm) Valve Size		6" (150 mm) Valve Size	
	A	B	A	B
ANSI B16.1 (CLASS 125)	7.50 (190,5)	0.75 (19,0)	9.50 (241,3)	0.88 (22,2)
ISO 2084 (PN10)†	7.09 (180,0)	0.71 (18,0)	9.45 (240,0)	0.87 (22,0)

†Same drilling as for BS 4504 Section 3.2 (PN10) and DIN 2532 (PN10).

TABLE A
DIMENSIONAL SPECIFICATIONS FOR SELECTION OF FLANGE DRILLING



- | | | |
|---|--|--|
| 1 - Body | 21 - Auxiliary Clapper Facing Retainer | 32 - Auxiliary Clapper Seat Ring Internal Bore O-Ring |
| 2 - Seat Ring | 22 - Auxiliary Clapper Facing | 33 - Clapper Arm Pin |
| 3 - Clapper Cotter Pin (2 req'd) | 23 - Auxiliary Clapper Nut | 34 - Clapper Arm |
| 4 - Lower Clapper | 24 - Pipe Plug, 3/8" NPT for 4" valve (2 req'd), 1/2" NPT for 6" valve (2 req'd) | 35 - Pipe Plug, 1/2" NPT |
| 5 - Clapper Washer | 25 - Auxiliary Clapper Assembly Locknut | 36 - Push Rod Screw |
| 6 - Clapper Facing | 26 - Auxiliary Clapper Spring | 37 - Spirol Pin |
| 7 - Clapper | 27 - Auxiliary Clapper Cover | 38 - Handhole Cover Bolts, 1/2"-13 UNC x 1-1/2" (6 req'd for 4" valve, 8 req'd for 6" valve) |
| 8 - Lower Latch | 28 - Auxiliary Clapper Cover Screws, 3/8"-16UNC x 1-3/4" (4 req'd) | 39 - Upper Latch Cotter Pins (2 req'd) |
| 9 - Washer (4 req'd) | 29 - Auxiliary Clapper Cover Gasket | 40 - Belleville Spring |
| 10 - Lower Latch Screw | 30 - Handhole Cover | 41 - Pipe Plug, 1/4" NPT |
| 11 - Upper Latch | 31 - Handhole Cover Gasket | 42 - Communicating Port Liner |
| 12 - Upper Clapper Nut | | 43 - Dow Corning FS3452 Fluorosilicone Grease* |
| 13 - Upper Latch Pin | | |
| 14 - Clapper Latch | | |
| 15 - Clapper Latch Pin | | |
| 16 - Push Rod Screw | | |
| 17 - Auxiliary Clapper Rod | | |
| 18 - Auxiliary Clapper Rod O-Ring | | |
| 19 - Auxiliary Clapper Seat Ring | | |
| 20 - Auxiliary Clapper Seat Ring O-Ring | | |

* 1.5 grams of FS3452 is required to lubricate Items 17, 18, and 32. Item 17 is to be lubricated its entire length.

FIGURE B
MODEL F302/F3021 DRY PIPE VALVE
— ASSEMBLY —

Table B shows the system air pressure requirements as a function of the water supply pressure. The air pressure in the sprinkler system is recommended to be automatically maintained by using one of the following pressure maintenance devices, as appropriate, and nitrogen pressure may be used in lieu of air pressure.

- Model F324 Air Maintenance Device (pressure reducing type), refer to Technical Data Sheet TD111.
- Model F326 Air Maintenance Device (compressor control type), refer to Technical Data Sheet TD112.
- Model F328 Nitrogen Maintenance Device (high pressure reducing type), refer to Technical Data Sheet TD113.

The Pressure Relief Valve (Item 9 - Fig. F) is factory set to relieve at a pressure of approximately 45 psi (3,1 bar). If the normal system air pressure is less than or exceeds 40 psi (2,8 bar), then the pressure Relief Valve must be reset to relieve at a pressure which is in accordance with the requirements of the Authority Having Jurisdiction.

Quick Opening Device:

As an option, the Model F302/F3021 Dry Pipe Valves may be equipped with the Model F311 Dry Pipe Valve Accelerator described in Technical Data Sheet TD109.

The F311 is used for the purpose of obtaining a reduction in the time to valve operation following the operation of one or more automatic sprinklers, and in some cases may be required to meet the requirements of the National Fire Protection Association for systems having a capacity greater than 500 gallons (1890 litres).

OPERATING PRINCIPLES

The Model F302/F3021 Dry Pipe Valves are differential, latch type valves that utilize a substantially lower system (air) pressure than the supply (water) pressure, to maintain the set position shown in Figure C-1. The differential nature of the F302/F3021 is provided by a linkage mechanism which provides the majority of force necessary to hold the waterway Clapper closed. The difference is such that 1 psi (0,07 bar) of system air pressure can hold approximately 6 psi (0.4 bar) of water supply pressure.

The minimum system air pressure (Ref. Table B) is, therefore, calculated

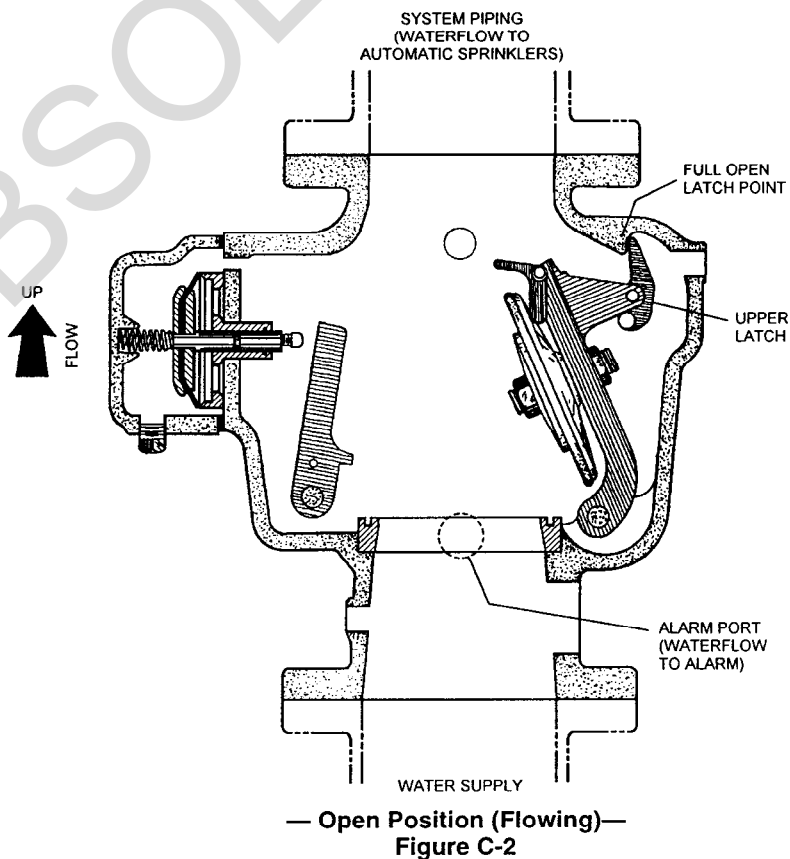
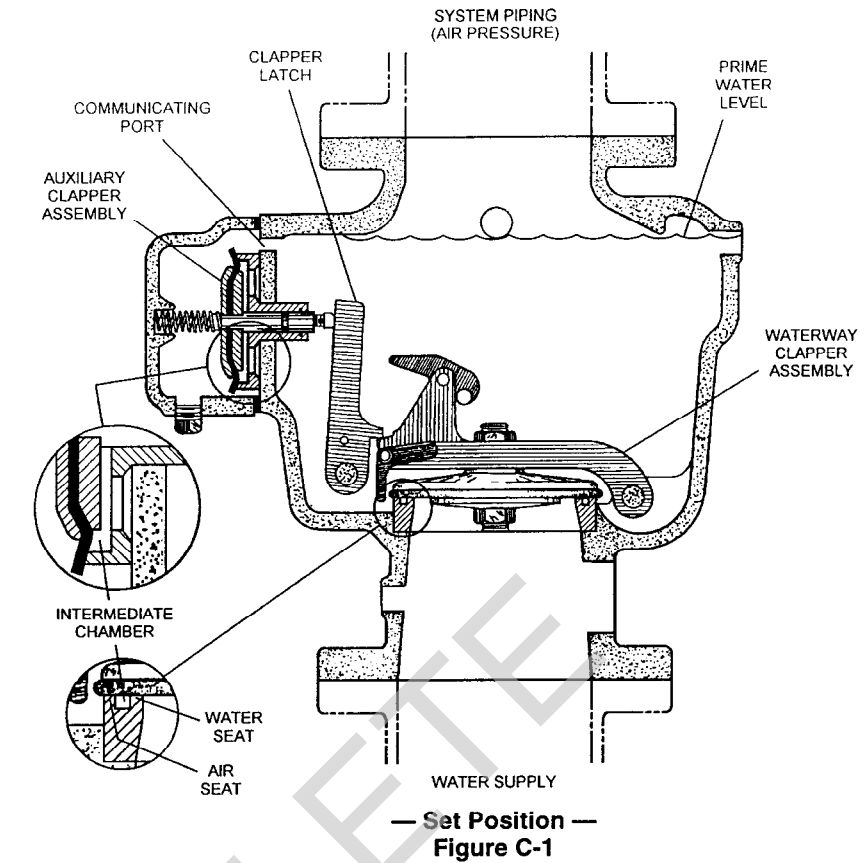


FIGURE C
MODEL F302/F3021 DRY PIPE VALVES
— SET AND OPEN POSITIONS —

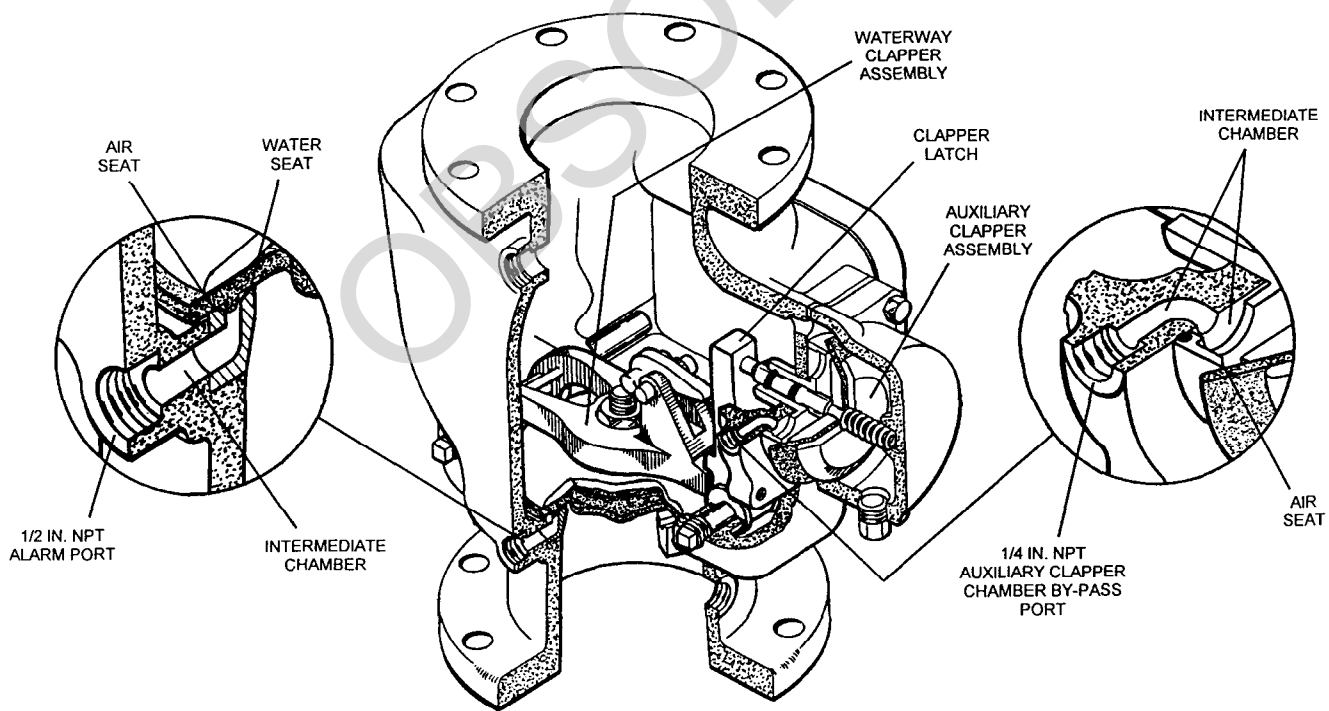
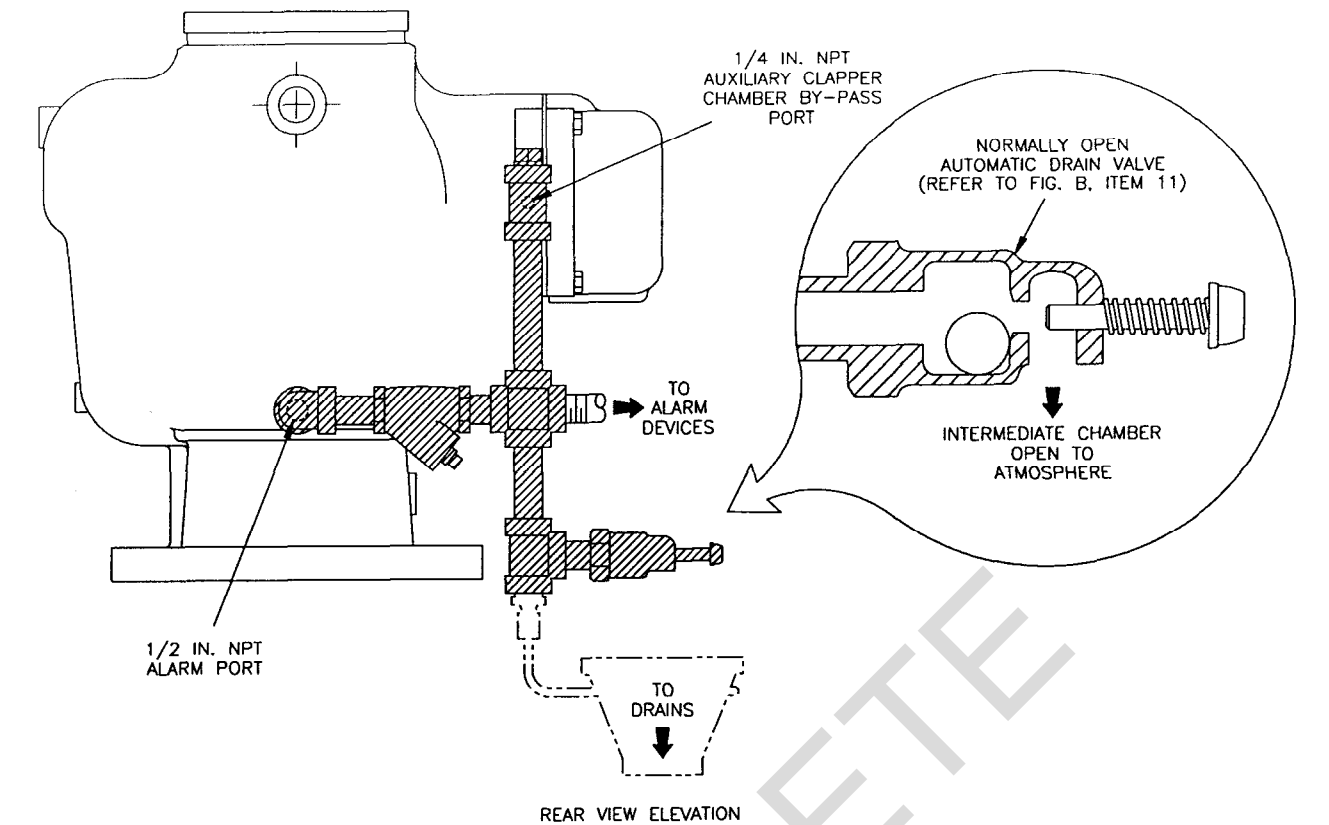


FIGURE D
MODEL F302/F3021 DRY PIPE VALVES
— INTERMEDIATE CHAMBER —

Maximum Water Supply Pressure, psi, (bar)	System Air Pressure Range, psi, (bar)
50 (3,4)	28 - 34 (1,9 - 2,3)
75 (5,2)	32 - 38 (2,2 - 2,6)
100 (6,9)	36 - 43 (2,5 - 3,0)
125 (8,6)	39 - 46 (2,7 - 3,2)
150 (10,3)	45 - 53 (3,1 - 3,7)
175 (12,1)	50 - 58 (3,4 - 4,0)

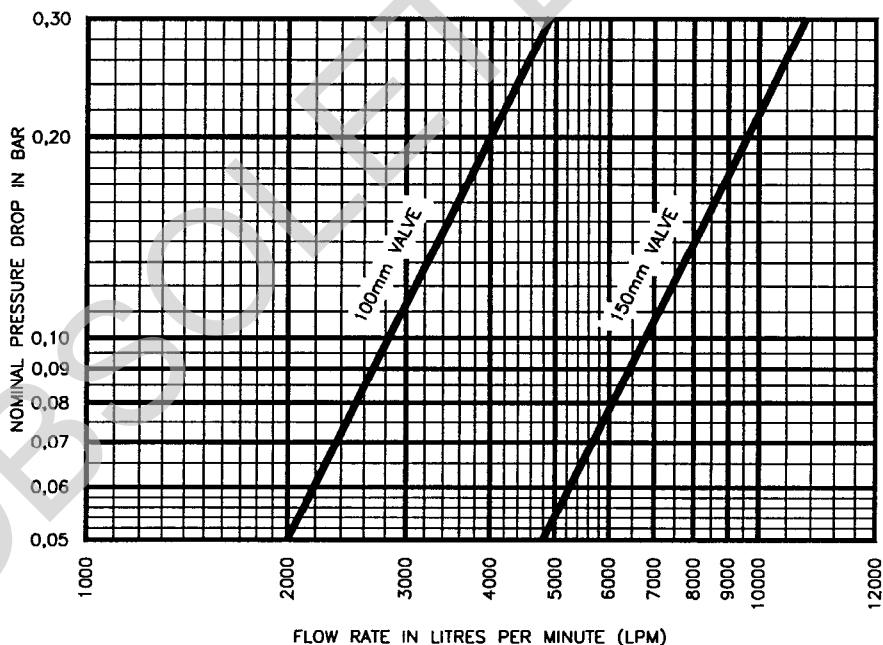
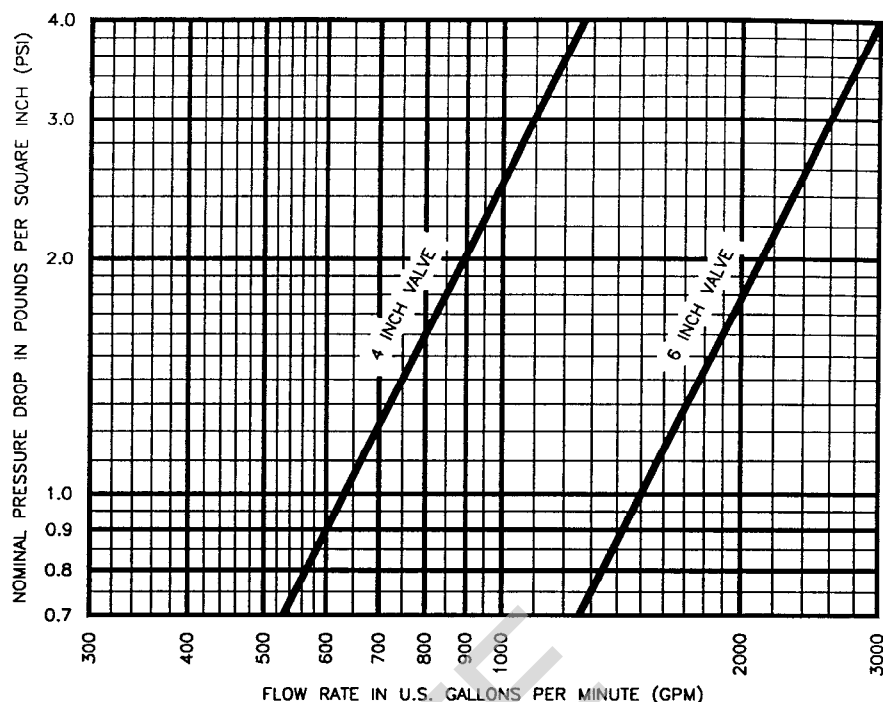
**TABLE B
SYSTEM AIR PRESSURE
REQUIREMENTS**

to be approximately 1/6 of the static water supply pressure, plus a 20 psi (1,4 bar) safety factor, to help prevent a false operation that might otherwise occur due to water supply pressure fluctuations.

Priming water within the body of the F302/F3021 Valves, as shown in Figure C-1, helps to maintain a tight air seal at the two air seats. System air pressure entering the Auxiliary Chamber Cover via the Communicating Port presses inward against the Auxiliary Clapper Assembly. The Auxiliary Clapper Assembly in turn bears against the Clapper Latch, which is engaged with the Waterway Clapper Assembly to hold the F302/F3021 Valve closed.

An intermediate chamber is formed adjacent to the air seats (2 places) and by the interconnecting valve trim (Ref. Figure D). The intermediate chamber is normally open to atmosphere through the Automatic Drain Valve (Ref. Figure D).

Having the intermediate chamber open to atmosphere is critical to the F302/F3021 Valve remaining set, otherwise the full resulting pressure of the system air pressure exerted on the Auxiliary Clapper Assembly cannot be realized. For example, if the system air pressure is 40 psi (2,7 bar) and there was 25 psi (1,7 bar) pressure trapped in the intermediate chamber, the resulting pressure across the Auxiliary Clapper Assembly would only be 15 psi (1,0 bar), which would be insufficient to hold the Waterway Clapper Assembly closed against a water supply pressure of 100 psi (6,9 bar). It is for this reason that the plunger of the Automatic Drain Valve should be depressed several times during resetting of the F302/F3021 Valve, as well as during inspections, to make certain that the Automatic Drain Valve is open.



**GRAPHS A-1 and A-2
NOMINAL PRESSURE LOSS VERSUS FLOW**

When one or more automatic sprinklers operate in response to a fire, air pressure within the system piping is relieved. When the air pressure becomes sufficiently reduced and with the resulting decrease of force exerted on the Auxiliary Clapper Assembly, the water pressure overcomes the differential holding the Waterway Clapper Assembly closed and the Waterway Clapper Assembly swings clear of the water seat to permit waterflow into the system piping and subsequently to be discharged from any open sprinklers.

Under full flow conditions, the Waterway Clapper Assembly will latch open as shown in Figure C-2. Also, with the Waterway Clapper Assembly open, the intermediate chamber is pressurized and water flows, via the groove in the Seat Ring, through the alarm port at the rear of the F302/F3021 Valve to actuate the system waterflow alarms. The flow from the alarm port is also sufficient to close the otherwise normally open Automatic Drain Valve (Ref. Figure D and Item 11, Fig. F).

INSTALLATION

NOTES

Proper operation of the Model F302/F3021 Dry Pipe Valve depends upon its trim being installed in accordance with the instructions given in this Technical Data Sheet. Failure to follow the trim diagram or the instructions given in this Technical Data Sheet may prevent the F302/F3021 Valve from functioning properly, as well as void listings, approvals, and the manufacturer's warranties.

The F302/F3021 Valves are shipped with a restraining wire tied around the Clapper Latch and Clapper Arm to prevent movement of these components during shipment. The restraining wire must be removed. Failure to do so will prevent the F302/F3021 Valve from functioning properly.

The F302/F3021 Valve must be installed in a readily visible and accessible location.

The F302/F3021 Valve and associated trim must be maintained at a minimum temperature of 40°F/4°C.

Heat tracing of the F302/F3021 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.

The Model F302/F3021 Dry Pipe Valve is to be installed in accordance with the following criteria:

1. All nipples, fittings, and devices must be clean and free of scale and burrs before installation. Use pipe thread sealant sparingly on male pipe threads only.
2. The F302/F3021 Valve must be trimmed in accordance with Figure F.
3. Care must be taken to make sure that check valves, strainers, globe valves, etc. are installed with the flow arrows in the proper direction.
4. Drain tubing to the drip funnel must be installed with smooth bends that will not restrict flow.
5. The main drain and drip funnel drain may be interconnected provided a check valve is located at least 12 inches (300 mm) below the drip funnel.
6. Suitable provision must be made for disposal of drain water. Drainage water must be directed such that it will not cause accidental damage to property or danger to persons.

7. Unused pressure alarm switch and/or water motor alarm connections must be plugged.

8. The Pressure Relief Valve provided with the Valve Trim is factory set to relieve at a pressure of approximately 45 psi (3,1 bar), which can typically be used for a maximum normal system air pressure of 40 psi (2,8 bar). The Pressure Relief Valve may be reset to a lower or higher pressure; however, it must be reset to relieve at a pressure which is in accordance with the requirements of the Authority Having Jurisdiction.

To reset the Pressure Relief Valve, first loosen the jam nut and then adjust the cap accordingly — clockwise for a higher pressure setting or counterclockwise for a lower pressure setting. After verifying the desired pressure setting, tighten the jam nut.

9. Installation of an Air Maintenance Device, as described in the Technical Data Section, is recommended.

10. An Inspector's Test Connection as required By NFPA 13 must be provided on the system piping at the most remote location from the F302/F3021 Valve.

11. Conduit and electrical connections are to be made in accordance with the requirements of the authority having jurisdiction and/or the National Electric Code.

12. Before hydrostatic tests are performed in accordance with NFPA 13 system acceptance test requirements, the Waterway Clapper Assembly is to be manually latched open (Ref. Figure C-2); the Automatic Drain Valve (Item 11-Fig. F) is to be temporarily replaced with a 1/2 inch NPT pipe plug; and, the Auxiliary Clapper Cover Screws, as well as Handhole Cover Bolts, are to be tightened using a cross-draw sequence.

VALVE SETTING PROCEDURE

Steps 1 through 17 are to be performed when initially setting the Model F302/F3021 Dry Pipe Valve; after an operational test of the fire protection system; or, after system operation due to a fire.

1. Close the Main Control Valve, close the Air Supply Control Valve, and close the Accelerator Control Valve, if applicable.
2. Open the Main Drain Valve and all auxiliary drains in the system. Close the auxiliary drain valves after water

ceases to discharge. Leave the Main Drain Valve open.

3. Depress the plunger of the Automatic Drain Valve to verify that it is open and that the F302/F3021 Valve is completely drained.

4. Verify that both the Air and Water Pressure Gauges are reading zero (0).

5. Open the Alarm Control Valve (Fig. F), if it was closed to silence local alarms.

It is recommended that the Alarm Control Valve be wire sealed in the open position with a No. 16 twisted wire, the ends of which are secured by a lead seal. The wire seal should be looped through the hole in the handle and tightly twisted around the pipe nipple adjacent to the handle.

6. Disassemble the Y-Strainer (Item 10, Fig. F), thoroughly clean-out the basket, and then reassemble the Y-Strainer.

7. As necessary, replace all sprinklers that have operated. Replacement sprinklers must be of the same type and temperature rating as those which have operated.

NOTE

In order to prevent the possibility of a subsequent operation of an overheated solder type sprinkler, any solder type sprinklers which were possibly exposed to a temperature greater than their maximum rated ambient must be replaced.

8. Remove the Handhole Cover, and then remove the Auxiliary Clapper Cover, being careful not to lose the Auxiliary Clapper Spring.

Thoroughly clean all interior parts of the F302/F3021 Valve, and make certain that the Communicating Port (Ref. Fig. C-1) between the Body and the Auxiliary Clapper Cover is wide open.

Use a clean cloth to wipe the Auxiliary and Waterway Clapper Seat Rings, as well as the Clapper Facings. Inspect the Clapper Facings and Seat Rings for damage.

After unlatching the Waterway Clapper Assembly from its tripped (latched) position (Ref. Figure C-2), check the Waterway Clapper Assembly, Auxiliary Clapper Assembly, Clapper Latch, Upper Latch and Lower Latch for freedom of movement.

When checking the Auxiliary Clapper Assembly for freedom of move-

ment, make certain that it moves freely all the way into and out of the Auxiliary Seat Ring, and that the Auxiliary Clapper Rod is completely lubricated its entire length with Dow Corning Fluorosilicone FS3452 grease. If any binding is experienced, check the entire length of the Clapper Rod for damage.

Worn or damaged parts must be replaced and the F302/F3021 Valve must be reassembled in accordance with Figure B.

9. Reseat the Waterway Clapper Assembly, engage the Clapper Latch with the nose of the waterway Clapper Arm, and check for proper seating of the Auxiliary Clapper Assembly according to Figure G.

NOTE

Make certain that the Lower Latch does not prevent the Waterway Clapper Assembly from being properly seated. When the Waterway Clapper Assembly is properly seated, the Lower Latch should be able to swivel freely.

10. Replace the Auxiliary Clapper Cover and Gasket making certain that the Auxiliary Clapper Spring is in place. Tighten the Auxiliary Clapper Cover Screws using a cross-draw sequence.

Reach inside the Handhole Cover opening and try to spin the Auxiliary Clapper Rod of the Auxiliary Clapper Assembly between your thumb and index finger. If it spins with some resistance or does not spin at all, then the Auxiliary Clapper Facing is adequately seated against the Auxiliary Seat Ring (i.e., the Auxiliary Clapper Facing is binding against the Auxiliary Seat Ring). If it freely spins, then pull it towards the Clapper Latch until it no longer spins or resistance to spinning is encountered. If adequate seating of the Auxiliary Clapper Facing cannot be obtained, as is evidenced by a Auxiliary Rod that spins freely, remove the Auxiliary Clapper Cover and refer to Figure G.

Replace Handhole Cover and Gasket. Tighten the Handhole Cover Screws using a cross-draw sequence.

11. Open the Priming Valve, and open the Priming Test Valve.

Prime the F302/F3021 Valve by slowly pouring water into the Priming Cup. When water discharges from the Priming Test Valve, cease pouring water into the Priming Cup. The 4 Inch (100 mm) F302/F3021 Valve will require approximately 1.4 gallons (5.3 litres) of prime water, and

the 6 Inch (150 mm) F302/F3021 Valve will require approximately 3.0 gallons (11.4 litres) of prime water.

After water stops discharging from the Priming Test Valve, close the Priming Valve and the Priming Test Valve.

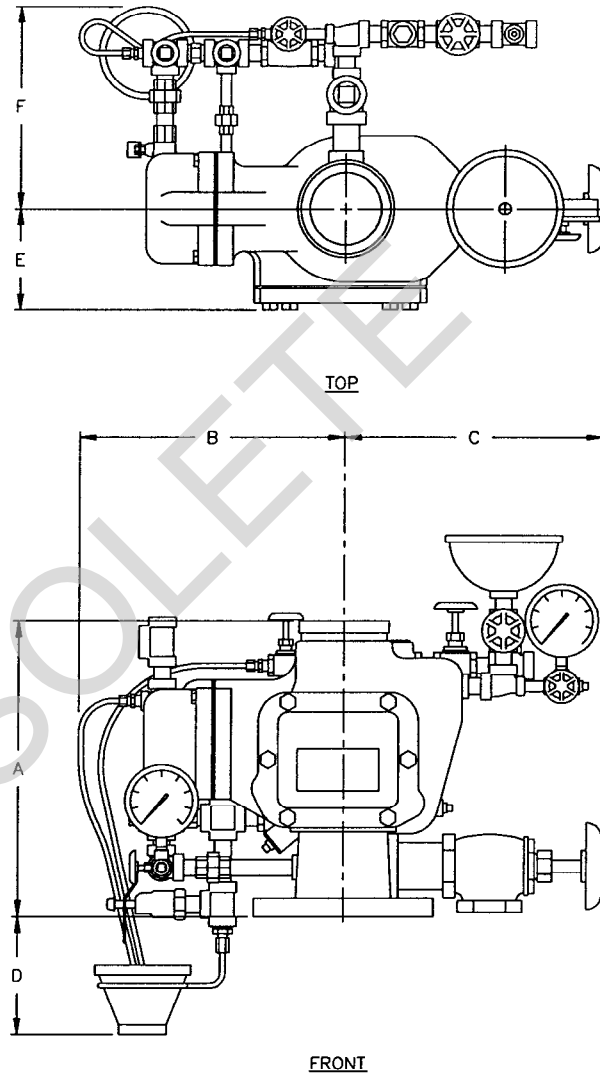
NOTE

Slight weepage of prime water

from the Automatic Drain Valve may be ignored until Step 12 is completed.

12. Pressurize the system with air (nitrogen) to 20 psi (1,4 bar). Depress the plunger on the Automatic Drain Valve to make sure it is open and that there is no water or air discharging.

The absence of water and/or air dis-



Nominal Installation Dimensions in Inches and (mm)						
VALVE SIZE	A	B*	C*	D	E	F
4 (100)	15 (381,0)	13-1/2 (340)	13 (325)	6 (150)	5 (125)	12 (300)

* MINIMUM CLEARANCE, ADDITIONAL 2" (50 mm) IS RECOMMENDED

FIGURE E-1
NOMINAL INSTALLATION DIMENSIONS FOR
4 INCH (100 mm) MODEL F302/F3021 DRY PIPE VALVES

charging is an indication that the Auxiliary Clapper Assembly is properly set. If water and/or air is discharging, refer to the Care and Maintenance section under Automatic Drain Valve Inspection to determine/correct the cause of the leakage problem.

13. Individually open all auxiliary drain valves in the system piping to drain

any remaining water in trapped sections. Close each drain valve as soon as water ceases to discharge.

14. Refer to Table B and then restore the system to the normal system air pressure necessary to hold the F302/F3021 Valve in the set position.
15. Depress the plunger on the Auto-

matic Drain Valve to make sure it is open and that there is no water or air discharging.

The absence of water and/or air discharging is an indication that the Waterway Clapper Assembly and Auxiliary Clapper Assembly are both properly set. If water and/or air is discharging, refer to the Care and Maintenance section under Automatic Drain Valve Inspection to determine/correct the cause of the leakage problem.

16. If the F320/F3021 is equipped with a Model F311 Dry Pipe Valve Accelerator, refer to Technical Data Sheet TD109 for resetting instructions.

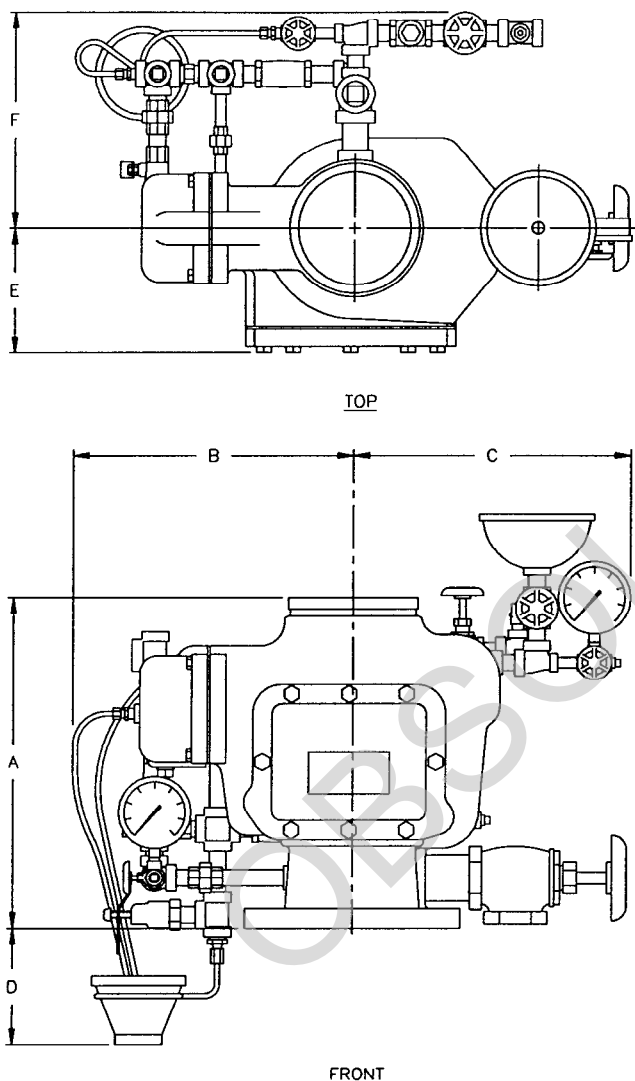
17. Slowly open the Main Control Valve. Close the Main Drain Valve as soon as water discharges from the drain connection.

Depress the plunger on the Automatic Drain Valve to make sure that it is open and that there is no water discharging. The absence of water discharging is an indication that the Waterway Clapper Assembly and Auxiliary Clapper Assembly are properly set. If water is discharging, refer to the Care and Maintenance section under the Automatic Drain Valve Inspection to determine/correct the cause of the leakage problem.

If there are no leaks, the F302/F3021 Valve is ready to be placed in service and the Main Control Valve must then be fully opened.

NOTE

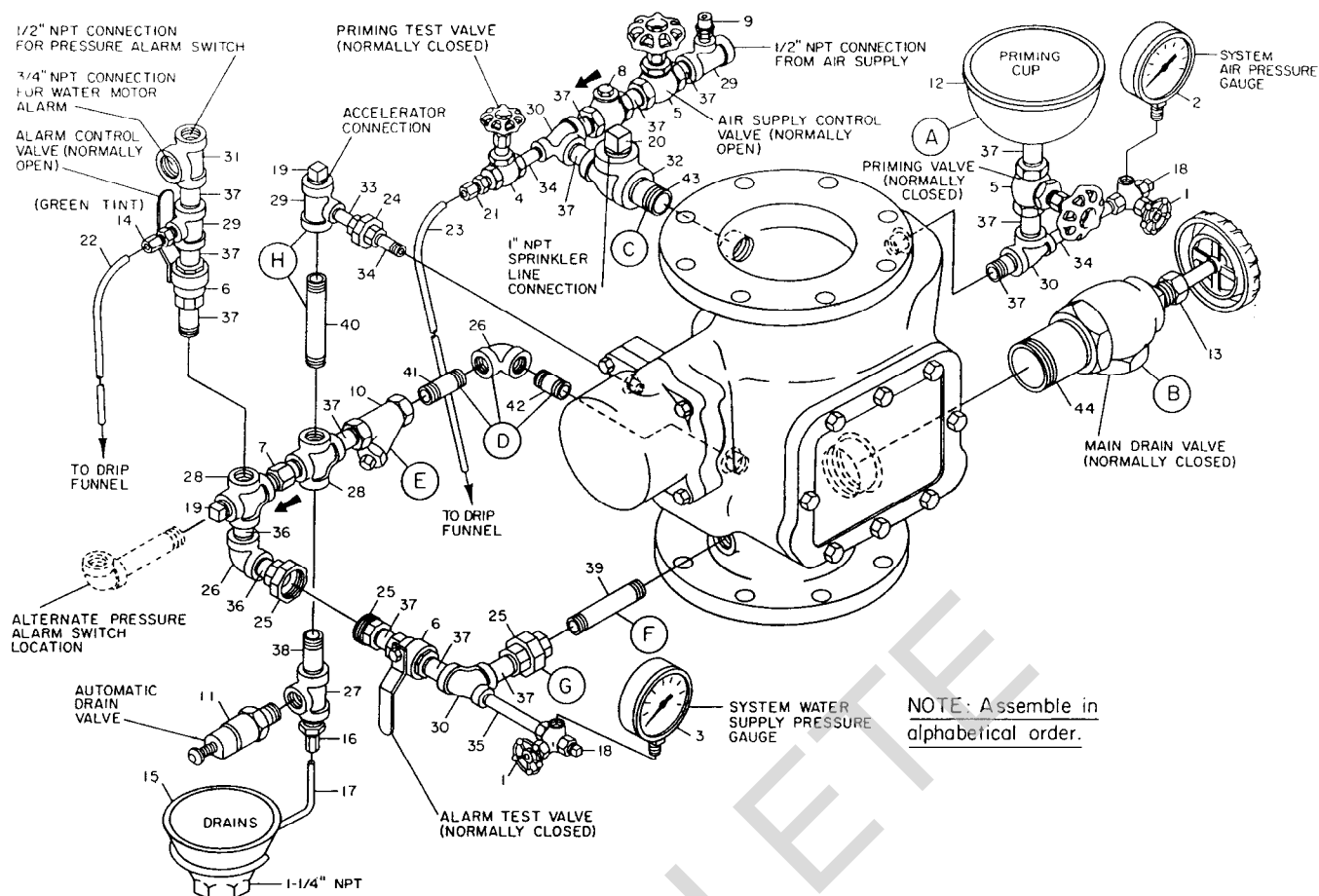
After setting a fire protection system, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.



Nominal Installation Dimensions in Inches and (mm)						
VALVE SIZE	A	B*	C*	D	E	F
6 (150)	17 (431,8)	15-1/4 (390)	14-1/4 (360)	6 (150)	6-3/8 (160)	12 (300)

* MINIMUM CLEARANCE, ADDITIONAL 2" (50 mm) IS RECOMMENDED

FIGURE E-2
NOMINAL INSTALLATION DIMENSIONS FOR
6 INCH (150 mm) MODEL F302/F3021 DRY PIPE VALVES



- | | | |
|---------------------------------------|---------------------------------------|--|
| 1 - 1/4" Gauge Test Valve (2 req'd) | 16 - Drip Funnel Connector | 32 - 1" x 1/2" x 1" Tee |
| 2 - 250 lb. Air Pressure Gauge | 17 - Drip Funnel Bracket | 33 - 1/4" x 2" Nipple |
| 3 - 300 lb. Water Pressure Gauge | 18 - 1/4" Plug (2 req'd) | 34 - 1/4" x 1-1/2" Nipple (3 req'd) |
| 4 - 1/4" Globe Valve | 19 - 1/2" Plug (2 req'd) | 35 - 1/4" x 3-1/2" Nipple (2 req'd) |
| 5 - 1/2" Globe Valve (2 req'd) | 20 - 1" Plug | 36 - 1/2" x close Nipple (2 req'd) |
| 6 - 1/2" Ball Valve (2 req'd) | 21 - 1/4" Tubing Connector | 37 - 1/2" x 1-1/2" Nipple (14 req'd) |
| 7 - 1/2" Spring Loaded Check Valve | 22 - 1/4" Tube, 12" long | 38 - 1/2" x 3" Nipple |
| 8 - 1/2" Swing Check Valve | 23 - 1/4" Tube, 18" long | 39 - 1/2" x 4" Nipple |
| 9 - 1/4" Pressure Relief Valve | 24 - 1/4" Union | 40 - 1/2" 2-1/2" Nipple for 4" valve, 1/2" x 5" Nipple for 6" valve |
| 10 - 1/2" Y-Strainer | 25 - 1/2" Union (2 req'd) | 41 - 1/2" x close Nipple for 4" valve, 1/2" x 2" Nipple for 6" valve |
| 11 - 1/2" Automatic Drain Valve, F793 | 26 - 1/2" 90° Elbow (2 req'd) | 42 - 1/2" x 4" Nipple for 4" valve, 1/2" x 3" Nipple for 6" valve |
| 12 - Priming Cup | 27 - 1/2" Tee | 43 - 1" x 2-1/2" Nipple |
| 13 - 2" Angle Valve | 28 - 1/2" Cross (2 req'd) | 44 - 2" x 3-1/2" Nipple |
| 14 - 3/32" Vent Fitting | 29 - 1/2" x 1/2" x 1/4" Tee (3 req'd) | |
| 15 - Drip Funnel | 30 - 1/2" x 1/4" x 1/2" Tee (3 req'd) | |
| | 31 - 1/2" x 1/2" x 3/4" Tee | |

NOTES:

1. The nipples utilized in the trim arrangement are Schedule 40 steel per ASTM A53 or A135 and they are threaded per ANSI B1.20.1. The fittings are either malleable iron per ANSI B16.3 or cast iron per ANSI B16.4.
2. "Standard Order" trim is provided with black nipples and fittings; however, galvanized nipples and fittings are available on "Special Order".

FIGURE F
"STANDARD ORDER" FACTORY ASSEMBLED VALVE TRIM

CARE AND MAINTENANCE

The following procedures and inspections should be performed as indicated, in addition to any specific requirements of the NFPA, and any impairment must be immediately corrected. It is also recommended that fire protection systems be inspected by a qualified Inspection Service.

NOTES

The operational test procedure and waterflow pressure alarm test procedure, result in operation of the associated alarms. Consequently, notification must first be given to the owner and the fire department, central station, or other signal station to which the alarms are connected.

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 systems must first be obtained from the proper authorities and all personnel who may be affected by this decision must be notified.

Annual Operation Test Procedure

Proper operation of the F302/F3021 Valve (i.e., opening of the F302/F3021 Valve as during a fire condition) should be verified at least once a year as follows:

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 Valve.
 - d. Close the Main Drain Valve.
2. Open the system's Inspector's Test Connection.
3. Verify that the F302/F3021 Valve has operated, as indicated by the flow of water into the system and that all waterflow alarms operated properly.
4. Close the system's Main Control Valve.
5. Reset the F302/F3021 Valve in accordance with the Valve Setting Procedure.

Quarterly Waterflow Alarm Test Procedure

Testing of the system waterflow alarms should be performed at least quarterly. To test the waterflow alarm, open the Alarm Test Valve, which will allow a flow of water to the Waterflow Pressure Alarm Switch and/or Water Motor Alarm. Upon satisfactory completion of the test, close the Alarm Test Valve.

Water Supply Pressure Gauge Inspection

The Water Pressure Gauge is to be inspected at least each week to ensure that normal system water supply pressure is being maintained.

System Air Pressure Inspection

The System Air Pressure Gauge is to be inspected at least each week to ensure that normal system air pressure is being maintained.

Dry Pipe Automatic Drain Valve Inspection

The Automatic Drain Valve should be inspected at least each week by depressing the plunger and checking to ensure that the Automatic Drain Valve is not discharging water and/or air. Discharging of water and/or air is an indication that the air and/or water seats are leaking, which could subsequently cause a false operation should the intermediate chamber become inadvertently pressurized.

If leakage is present, take the F302/F3021 Valve out of service (i.e., close the main control valve, open the main drain valve, close the accelerator control valve (if applicable), close the air supply control valve, and open the Inspector's Test Connection to relieve the system air pressure to zero (0) as indicated on the System Air Pressure Gauge). Remove the Handhole Cover and Auxiliary Clapper Cover and then check the following items:

- A. **Auxiliary Clapper Assembly.** Make sure that the Auxiliary Clapper Facing does not show signs of compression set, damage, etc. Replace the Clapper Facing if there are any signs of wear.

Refer to Figure B and make certain that the Auxiliary Clapper Assembly is properly assembled. Special attention should be given to the arrangement order of the Auxiliary Clapper, Auxiliary Clapper Facing, and Auxiliary Clapper Facing Retainer.

Refer to Figure G to check for a

properly seated Auxiliary Clapper Assembly.

- B. **Waterway Clapper Assembly:** Make sure that the Clapper Facing does not show signs of compression set, damage, etc. Replace the Clapper Facing if there are any signs of wear.

Refer to Figure B and make certain that the Waterway Clapper Assembly is properly assembled. Special attention should be given to the arrangement order of the Clapper, Clapper Facing, Clapper Washer, and Belleville Spring. The tapered side of the Clapper Washer must face up and the recessed side of the Belleville Spring must face up.

The Lower Clapper Nut should be snugly tightened. Check for over-tightening. Over tightening can cause the Clapper Facing to become slightly warped and thereby prevent proper seating.

- C. **Seat Rings:** Inspect the Seat Rings for nicks, damage, etc. If the Seat Rings are damaged, the F302/F3021 Valve will require replacement, since the Seat Rings are not field replaceable.

Priming Water Inspection

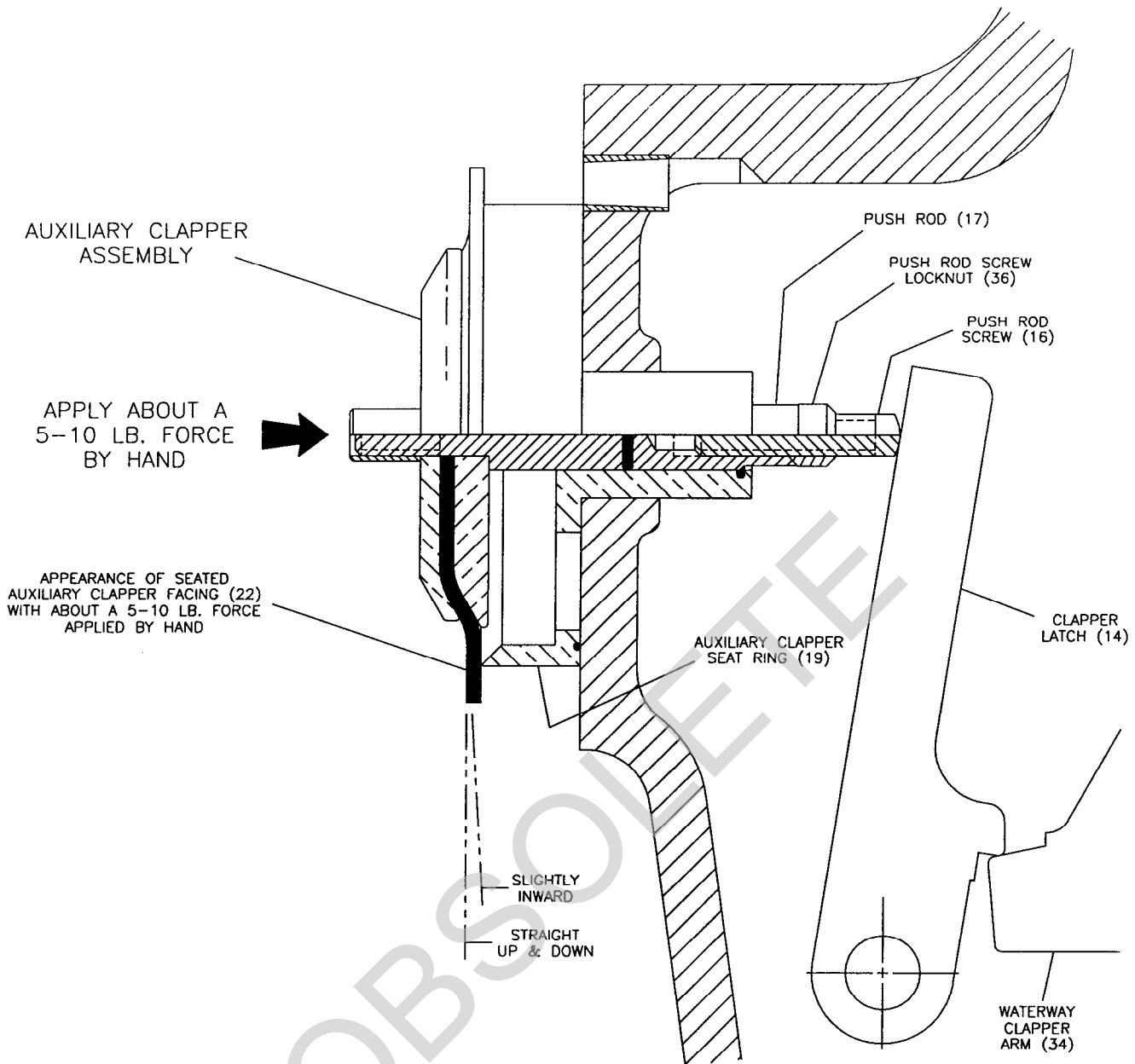
After a full flow annual operation test procedure or after a system operation, the priming level of the F302/F3021 Valves is to be inspected at least once each week, for one month. Otherwise, the priming level is to be inspected at least quarterly. Partially open the Priming Test Valve, and then close the Priming Test Valve when the priming level has been correctly established (i.e., when water stops discharging from the Priming Test Valve).

If no water discharges, close the Priming Test Valve and replenish the Priming Level by performing Steps 1, 2, 3, 4, 11, 12, 14, 15, 16, and 17 in the Valve Setting Procedure section.

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.



1. With the Clapper Latch (14) engaged with the Clapper Arm (34) and with about a 5 to 10 lb. force applied by hand against the Auxiliary Clapper Assembly, the appearance of the seated Auxiliary Clapper Facing (22) should be as shown in the above illustration (i.e., the seated Auxiliary Clapper Facing should be essentially straight up & down to slightly inward).
2. If the seated Auxiliary Clapper Facing (22) does not appear as shown, adjust the Push Rod Screw (16) in or out, accordingly, by first loosening the Push Rod Screw Locknut (36). After adjusting the Push Rod Screw (16) to obtain proper seating of the Auxiliary Clapper Facing (22), tighten the Push Rod Screw Locknut (36).

NOTES

Valves manufactured before 1983 utilized a Spirol Pin in addition to the Push Rod Screw Locknut (36), to hold the Push Rod Screw (16) setting. On a temporary basis, the Spirol Pin may be removed to facilitate readjustment of the Push Rod Screw (16); however, it is recommended that the Push Rod (17), Push Rod Screw (16), and Push Rod Screw Locknut (36) be replaced as soon as possible in accordance with Item B of the Field Service Notes & Recommendations given on Page 13.

When loosening or tightening the Push Rod Screw Locknut (36), only apply wrenches to the wrench flats of the Push Rod (17) and Push Rod Screw Locknut (36), to avoid scoring of the Push Rod (17). Scoring of the Push Rod could result in a failure of the Dry Pipe Valve to properly operate. A scored Push Rod must be replaced before placing the Dry Pipe Valve back in service.

FIGURE G
PROPERLY SEATED AUXILIARY CLAPPER ASSEMBLY

F302/F3021 DRY PIPE VALVE FIELD SERVICE NOTES & RECOMMENDATIONS

A. PROPER SEATING OF THE AUXILIARY CLAPPER ASSEMBLY

Whenever resetting the F302/F3021 Valve, and especially after replacing any internal components, it is recommended that proper seating of the Auxiliary Clapper Assembly be checked by referring to Figure G on Page 12. Doing so will help assure ease of resetting of the F302/F3021 Valve.

B. AUXILIARY CLAPPER ASSEMBLY

The materials for the Auxiliary Clapper Rod (17), Push Rod Screw (16), and Push Rod Screw Locknut (36) were changed from brass to stainless steel in 1982, 1983, and 1988, respectively. It is recommended that the brass components be replaced by the newer stainless steel versions to increase durability. When replacing these parts it will be necessary to replace the Auxiliary Clapper Rod O-Ring (18) and to lubricate the Auxiliary Clapper Rod with Dow Corning FS3452 Fluorosilicone Grease (43).

The material for the auxiliary Clapper Facing (22) was changed from EPDM (black) to silicone rubber (red) in 1980. It is recommended that this component in EPDM (black) be replaced by the newer silicone rubber (red) version to increase durability.

It is recommended that the Auxiliary Clapper Assembly (PSN 52-302-1-103) referred to under Replacement Valve Parts be ordered, whenever changing any of the noted parts to the recommended materials.

C. WATERWAY CLAPPER ASSEMBLY

The Clapper Facing (6) was changed from a flat facing material to a molded ribbed facing material in 1981. It is recommended that the flat Clapper Facing be replaced with the molded ribbed Clapper Facing. When replacing a flat Clapper Facing with a molded Clapper Facing, the Clapper Washer (5) must be oriented with the tapered side up, and a Belleville Spring (40) must be utilized with its recessed side facing up as shown in Figure B on Page 3. The molded Clapper Facing is to be oriented so that the raised center portion faces up and the thin raised rib faces down so as to seat within the groove in the Seat Ring (2).

D. CLAPPER LATCH

The Clapper Latch (14) for the 6 inch size F302/F3021 Valve was redesigned in 1986. The present "straight bar" design, illustrated in Figure B, is a direct replacement for the older design which had an offset adjacent to the contact area for the Push Rod Screw (18). It may be necessary to readjust the Auxiliary Clapper Assembly for proper seating as shown in Figure G, when replacing the Clapper Latch.

E. AUXILIARY SEAT RING

As of 1986 an Internal Bore O-Ring (32) was added to the Auxiliary Seat Ring. Older F302/F3021 Valves cannot be modified since the Auxiliary Seat Ring is not field replaceable.

F. AUTOMATIC DRAIN VALVE/ VALVE TRIM

If the Automatic Drain Valve is found to be missing, replace it immediately. Also make certain that the F302/F3021 Valve is properly trimmed per Figure F on Page 10. Doing so will help assure proper operation of the F302/F3021 Valve in the event of a fire and will help assure ease of resetting of the F302/F3021 Valve.

The currently used Model F793 Automatic Drain Valve is a direct replacement for the Model F791 Automatic Drain Valve that was used up to 1984.

G. SERVICE PARTS

It is recommended that arrangements be made to have on-hand the following items prior to servicing of an F302/F3021 Valve: Valve Replacement Parts Kit, Auxiliary Clapper Assembly, and Model F793 Automatic Drain Valve.

WARNING

All replacement parts must be purchased through Grinnell Corporation or one of its authorized distributors. The use of non-Grinnell manufactured replacement parts voids all warranties and may void laboratory approvals. Failure to use Grinnell manufactured replacement parts may result in failure of the Model F302/F3021 Dry Pipe Valves to properly operate.

ORDERING PROCEDURE

All orders for Model F302/F3021 Dry Pipe Valves, trim, accessories, and replacement parts must include the description and Product Symbol Number (PSN), where applicable. Unless otherwise specified, all trim arrangements are provided factory assembled as shown in Figure F. Unassembled packages can be provided on "special order".

"Standard Order" Valves with ANSI Flange Drilling:

Specify: (specify size) Model (specify) Dry Pipe Valve, PSN (specify).

Model F302 Flange x Flange

4" (100 mm).....	PSN 52-302-1-013
6" (150 mm).....	PSN 52-302-1-015

Model F3021 Flange x Groove

4" (100 mm).....	PSN 52-302-1-413
6" (150 mm).....	PSN 52-302-1-615

"Special Order" Valves with ISO Flange Drilling:

Specify: (specify size) Model (specify) Dry Pipe Valve with ISO flange drilling.

"Standard Order" Factory Assembled Black Trim:

Specify: (size) Inch F302/F3021 Black Trim, PSN 52-347-1-001.

"Special Order" Factory Assembled Galvanized Trim:

Specify: (size) Inch F302/F3021 Galvanized Trim, PSN 52-347-2-001.

Accessories:

Refer to the following Technical Data Sheets (TD), as applicable.

Model F311 Dry Pipe Accelerator	TD109
Waterflow Pressure Alarm Switch	TD213
Model F630 Water Motor Alarm	TD250
Model F324 Air Maintenance Device	TD111
Model F326 Air Maintenance Device	TD112
Model F328 Nitrogen Maintenance Device	TD113

Valve Replacement Parts Kit:

The Valve Replacement Parts Kit contains Items 6, 18, 22, 26, 29, 31, 32, and 43 illustrated in Figure B. It is recommended to have these parts readily available when servicing the Model F302/F3021 Dry Pipe Valve.

Specify: Valve Replacement Parts Kit for use with (specify size) inch Model F302/F3021 Dry Pipe Valve.

4" (100 mm).....	PSN 92-302-1-416
6" (150 mm).....	PSN 92-302-1-617

Replacement Valve Parts:

Specify: (description) for use with (specify size) Model F302/F3021 Dry Pipe Valve, PSN (specify).

4 inch (100 mm) Valve (Ref. Fig. B)

3 - Clapper Cotter Pin	PSN 62-381-1-007
4 - Lower Clapper Nut	PSN 62-389-1-013
5 - Clapper Washer	PSN 92-302-1-405
6 - Clapper Facing	PSN 92-302-1-406
7 - Clapper	PSN 92-302-1-407
8 - Lower Latch	PSN 92-302-1-608
9 - Washer	PSN 92-302-1-409
10 - Lower Latch Screw	PSN 62-614-1-004
11 - Upper Latch	PSN 92-302-1-411
12 - Upper Clapper Nut	PSN 92-741-1-013
13 - Upper Latch Pin	PSN 92-302-1-613
14 - Clapper Latch	PSN 92-302-1-414
15 - Clapper Latch Pin	PSN 92-302-1-415
16 - Push Rod Screw	PSN 92-302-1-616
17 - Auxiliary Clapper Rod	PSN 92-302-1-618
18 - Auxiliary Clapper Rod O-Ring	PSN 62-561-1-111
21 - Auxiliary Clapper Facing Retainer	PSN 92-302-1-622
22 - Auxiliary Clapper Facing	PSN 92-302-1-640
23 - Auxiliary Clapper	PSN 92-302-1-624
25 - Auxiliary Clapper Assembly Locknut	PSN 92-302-1-626
26 - Auxiliary Clapper Spring	PSN 92-302-1-627
27 - Auxiliary Clapper Cover	PSN 92-302-1-628
28 - Auxiliary Clapper Cover Screws	PSN 62-039-1-109
29 - Auxiliary Clapper Cover Gasket	PSN 92-302-1-630
30 - Handhole Cover	PSN 92-302-1-432
31 - Handhole Cover Gasket	PSN 92-302-1-433
32 - Auxiliary Clapper Seat Ring Internal Bore O-Ring	PSN 62-561-1-016
33 - Clapper Arm Pin	PSN 92-302-1-435
34 - Clapper Arm	PSN 92-302-1-436
36 - Push Rod Screw Locknut	PSN 92-302-1-638
37 - Spirol Pin	PSN 62-496-1-056
38 - Handhole Cover Bolt	PSN 62-039-1-208
39 - Upper Latch Cotter Pin	PSN 62-381-1-005
40 - Belleville Washer	PSN 62-404-1-018
43 - 1.5 grams* of FS3452	PSN 92-302-1-641
43 - 2 ounces of FS3452	PSN 92-302-1-642
- Waterway Clapper Assembly	PSN 92-302-1-443
- Auxiliary Clapper Assembly	PSN 52-302-1-103

* Sufficient for one application of lubricant to Auxiliary Clapper Rod.

6 inch (150 mm) Valve (Ref. Fig. B)

3 - Clapper Cotter Pin	PSN 62-381-1-013
4 - Lower Clapper Nut	PSN 62-389-1-015
5 - Clapper Washer	PSN 92-302-1-605
6 - Clapper Facing	PSN 92-302-1-606
7 - Clapper	PSN 92-302-1-607
8 - Lower Latch	PSN 92-302-1-608
9 - Washer	PSN 92-302-1-609
10 - Lower Latch Screw	PSN 62-614-1-004
11 - Upper Latch	PSN 92-302-1-611
12 - Upper Clapper Nut	PSN 92-741-1-015
13 - Upper Latch Pin	PSN 92-302-1-613
14 - Clapper Latch	PSN 92-302-1-614
15 - Clapper Latch Pin	PSN 92-302-1-615
16 - Push Rod Screw	PSN 92-302-1-616
17 - Auxiliary Clapper Rod	PSN 92-302-1-618
18 - Auxiliary Clapper Rod O-Ring	PSN 62-561-1-111
21 - Auxiliary Clapper Facing Retainer	PSN 92-302-1-622
22 - Auxiliary Clapper Facing	PSN 92-302-1-640
23 - Auxiliary Clapper	PSN 92-302-1-624
25 - Auxiliary Clapper Assembly Locknut	PSN 92-302-1-626
26 - Auxiliary Clapper Spring	PSN 92-302-1-627
27 - Auxiliary Clapper Cover	PSN 92-302-1-628
28 - Auxiliary Clapper Cover Screws	PSN 62-039-1-109
29 - Auxiliary Clapper Cover Gasket	PSN 92-302-1-630
30 - Handhole Cover	PSN 92-302-1-632
31 - Handhole Cover Gasket	PSN 92-302-1-633
32 - Auxiliary Clapper Seat Ring Internal Bore O-Ring	PSN 62-561-1-016
33 - Clapper Arm Pin	PSN 92-302-1-635
34 - Clapper Arm	PSN 92-302-1-636
36 - Push Rod Screw Locknut	PSN 92-302-1-638
37 - Spirol Pin	PSN 62-496-1-056
38 - Handhole Cover Bolt	PSN 62-039-1-208
39 - Upper Latch Cotter Pin	PSN 62-381-1-005
40 - Belleville Washer	PSN 62-404-1-019
43 - 1.5 grams* of FS3452	PSN 92-302-1-641
43 - 2 ounces of FS3452	PSN 92-302-1-642
- Waterway Clapper Assembly	PSN 92-302-1-643
- Auxiliary Clapper Assembly	PSN 52-302-1-103

* Sufficient for one application of lubricant to Auxiliary Clapper Rod.

Replacement Trim Parts :

Specify: (description) for use with
Model F302/F3021 Dry Pipe Valve,
PSN (specify).

Valve Trim (Ref. Fig. F)

1 - 1/4" Gauge Test Valve	PSN 46-005-1-002
2 - 250 lb. Air Pressure Gauge	PSN 92-343-1-012
3 - 300 lb. Water Pressure Gauge	PSN 92-343-1-005
4 - 1/4" Globe Valve	PSN 46-047-1-002
5 - 1/2" Globe Valve	PSN 46-047-1-004
6 - 1/2" Ball Valve	PSN 46-050-1-004
7 - 1/2" Spring Loaded Check Valve	PSN 92-322-1-002
8 - 1/2" Swing Check Valve	PSN 46-049-1-004
9 - 1/4" Pressure Relief Valve	PSN 92-343-1-020
10 - 1/2" Y-Strainer	PSN 52-353-1-005
11 - F793 Automatic Drain Valve	PSN 52-793-1-004
12 - Priming Cup	PSN 92-346-1-004
13 - 2" Angle Valve	PSN 46-048-1-009
14 - 3/32" Vent Fitting	PSN 92-032-1-002
15 - Drip Funnel	PSN 92-343-1-007
16 - Drip Funnel Connector	PSN 92-211-1-005
17 - Drip Funnel Bracket	PSN 92-211-1-003

WEIGHTS

The following are the nominal weights for the valves and trim:

4 Inch (100 mm) Model F302 Dry Pipe Valve . . .	107 lbs. (49 kg)
4 Inch (100 mm) Model F3021 Dry Pipe Valve . .	97 lbs. (44 kg)
6 Inch (150 mm) Model F302 Dry Pipe Valve . . .	165 lbs. (75 kg)
6 Inch (150 mm) Model F3021 Dry Pipe Valve . .	151 lbs. (69 kg)
Valve Trim	31 lbs. (15 kg)

OBSOLETE