

Reliable®

Model EX Low Pressure

Dry Pipe Valve

2" (DN50), 2½" (DN65), 76mm,
3" (DN80), 4" (DN100), 165mm,
6" (DN150) & 8" (DN200)

Instructions for Installation, Operation, Care and Maintenance

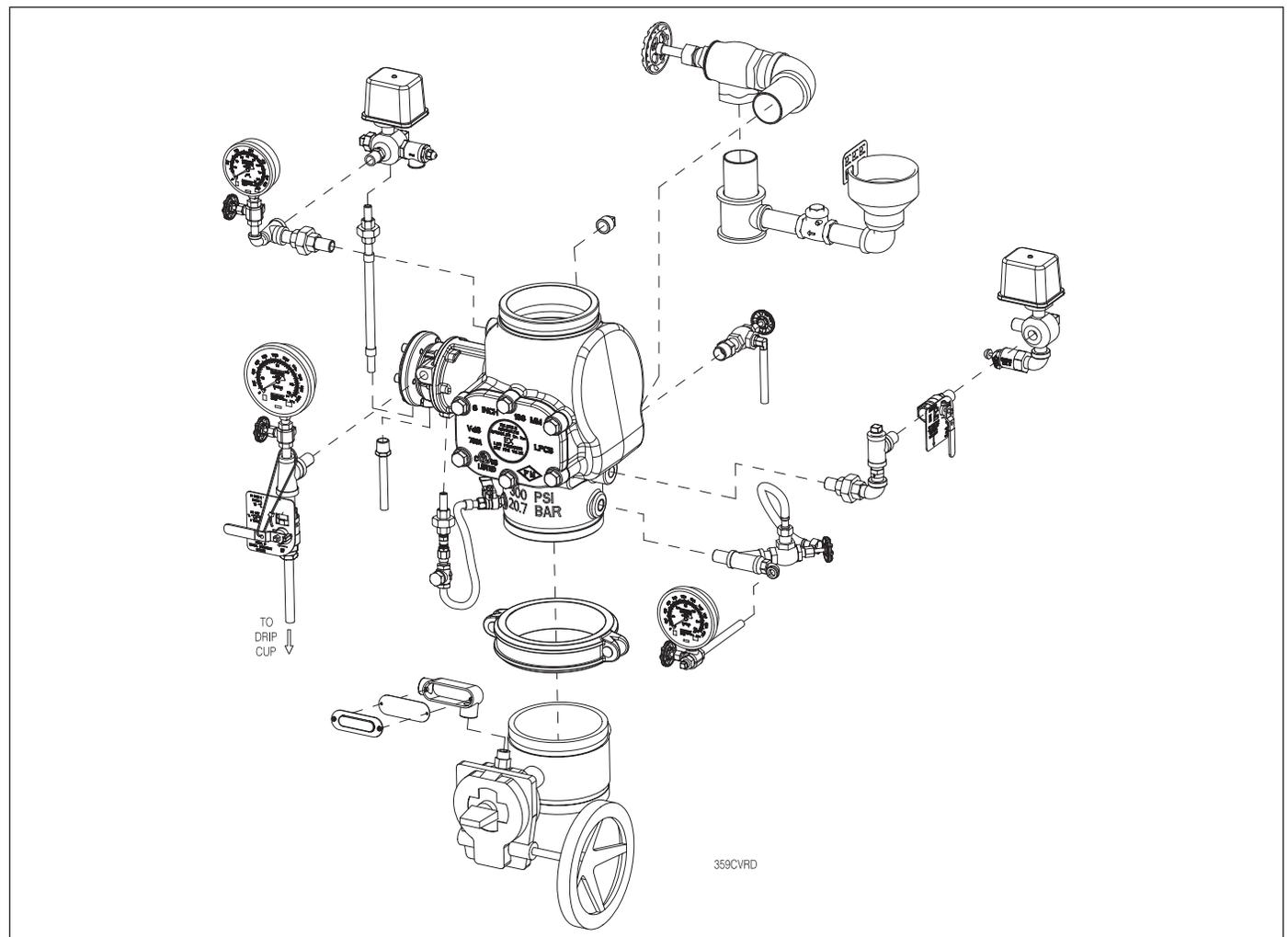
Features:

- Low Air Pressure System, 8 psi to 28 psi (0.6 to 1.9 bar).

Note: For retrofit applications where an existing pneumatic supply is available. The Reliable Model EX Dry Valve can be operated with 40 psi (2.8 bar) maximum air or nitrogen pressure. The higher pressure may result in a delay in valve operation and longer water delivery time when compared to the lower (design) pressures of the valve.

- Requires No Priming Water Allowing for Simplified Resetting

- Pressure rating of 250 psi (17.2 bar) or 300 psi (20.7 bar) [(4" (100 mm), 6" (150 mm) & 165 mm Only)]
- Externally Resettable
- Ductile Iron Construction to Reduce Weight
- Available in Groove-Groove, Flange- Groove and Flange-Flange End Configurations
- Trim is Available in Loose, Segmented or Fully Assembled to Valve, with or Without Control Valve



General Description:

The Reliable Model EX Low Pressure Dry Pipe Valve is a hydraulically operated, differential latching clapper-type valve (see Fig 1.) designed for use as a primary control valve in a dry pipe valve system. The Model EX Low Pressure Dry Pipe Valve allows the system's air or nitrogen pressure requirement to be considerably less than the available water supply pressure (see Table A, page 13). The following benefits are a direct result of the ability to use lower air pressure:

1. In refrigerated area systems, lower air pressure decreases the possibility of ice plugs, which could impede or prevent the flow of water to sprinkler heads in the event of fire.
2. Lower air pressure (volume) will enable smaller capacity, lower cost dehydration equipment when it is required.
3. Lower air or nitrogen pressure can reduce water delivery time when the system actuates, and in some cases, may eliminate the need for an accelerator.
4. Low pressure requirements make the use of dry nitrogen gas, instead of air, practical even on larger systems. Resulting benefits include a lower-than-air dew point, which minimizes ice plugging of system lines, and enhances "user friendliness" during installation and operation.
5. System maintenance is simplified since priming water is not required and the Dry Pipe Valve can be reset externally without cover removal. This is accomplished by pushing in and turning the external reset knob at the rear of the Dry Pipe Valve (see Fig. 1). This feature provides a significant system-restoration time advantage.

The Model EX Low Pressure Dry Pipe Valve's trim set (see Fig. 2) provides all of the necessary equipment for connections to the pushrod chamber's inlet and outlet ports, the 1/4" (30mm) or 2" (50mm) main drain, alarm devices, air supply, water supply, and required pressure gauges. This trim set is available in individual parts, in time-saving, segmentally assembled kit forms, or fully assembled to the Model EX Low Pressure Dry Pipe Valve (with or without a control valve).

All the sizes of the Model EX Low Pressure Dry Pipe Valve trim sets may be equipped with the optional Reliable Model B1 Accelerator, trim kit P/N 6516000003, (see Figs. 2, 3 & 4). This device acts as an exhaustor which will hasten the operation of the Model EX Low Pressure Dry Pipe Valve and minimize the water delivery time for the entire system.

Listings & Approvals:

Reliable Model EX Dry Pipe Valves, complete with trim, only when used as the valve manufacturer's complete system are:

1. Listed by Underwriters Laboratories Inc, and UL certified for Canada (cULus)
2. Certified by Factory Mutual Approvals (FM)
3. Loss Prevention Certification Board (LPCB)
4. VdS Schadenverhütung GmbH (VdS) (DN50, DN65, DN80, DN100, DN150, and DN200 sizes only).

5. EN Certificates (CE) per EN 12259-3:2000 + A1:2001 + A2:2005
DN50: 0786-CPR-40300
DN65: 0786-CPR-40301
DN80: 0786-CPR-40302
DN100: 0786-CPR-40303
DN150: 0786-CPR-40304
DN200: 0786-CPR-40305

System Operation:

The Reliable Model EX Low Pressure Dry Pipe Valve is shown in both closed and open positions in Fig. 1. In the closed position, the supply pressure acts on the underside of the clapper and also on the pushrod through the pushrod chamber's inlet restriction. The resultant force due to the supply pressure acting on the push rod is multiplied by the mechanical advantage of the lever and is more than sufficient to hold the clapper closed against normal supply pressure surges.

When a sprinkler operates, there will be a loss of air or nitrogen pressure (see note 1 below) in the sprinkler system piping which will cause the diaphragm and seal in the actuator chamber to move away from the seat. The separation of the seal from the seat allows a releasing discharge of water from the pushrod chamber. Since the pressure cannot be replenished through the inlet restriction as rapidly as it is vented, the pushrod chamber pressure falls instantaneously. When the push rod chamber pressure approaches approximately one-third of the supply pressure, the upward force of the supply pressure acting beneath the clapper overcomes the lever applied force thereby opening the clapper.

Once the clapper has opened, the lever acts as a latch, preventing the clapper from returning to the closed position. Water from the supply flows through the Model EX Low Pressure Dry Pipe Valve into the system piping. Water also flows through the Model EX Low Pressure Dry Pipe Valve's alarm outlet to the alarm devices.

After system shutdown, resetting the Model EX Low Pressure Dry Pipe Valve is quite simple. Doing so only requires pushing in and turning the reset knob at the rear of the valve (see Fig. 1). The external reset feature of the Model EX Low Pressure Dry Pipe Valve provides a means for simple, economical system testing, which is one essential facet of a good maintenance program. The external reset feature does not, however, eliminate another important facet of good maintenance, namely, periodic cleaning and inspection of the internal valve parts.

In the event that water builds up inside the valve due to condensate from the air supply system or water left inside from valve system testing, a drain is available for venting. After closing the main supply valve, a small valve over the drain cup can be opened slightly until the water inside the valve body and the main pipe column has drained. See the section titled "Draining Excess/Condensate Water From System" in this bulletin for the detailed procedure.

Note 1: Wherever the word "air" is used in this bulletin as a reference to the pneumatic pressure source it shall also mean "air or nitrogen."

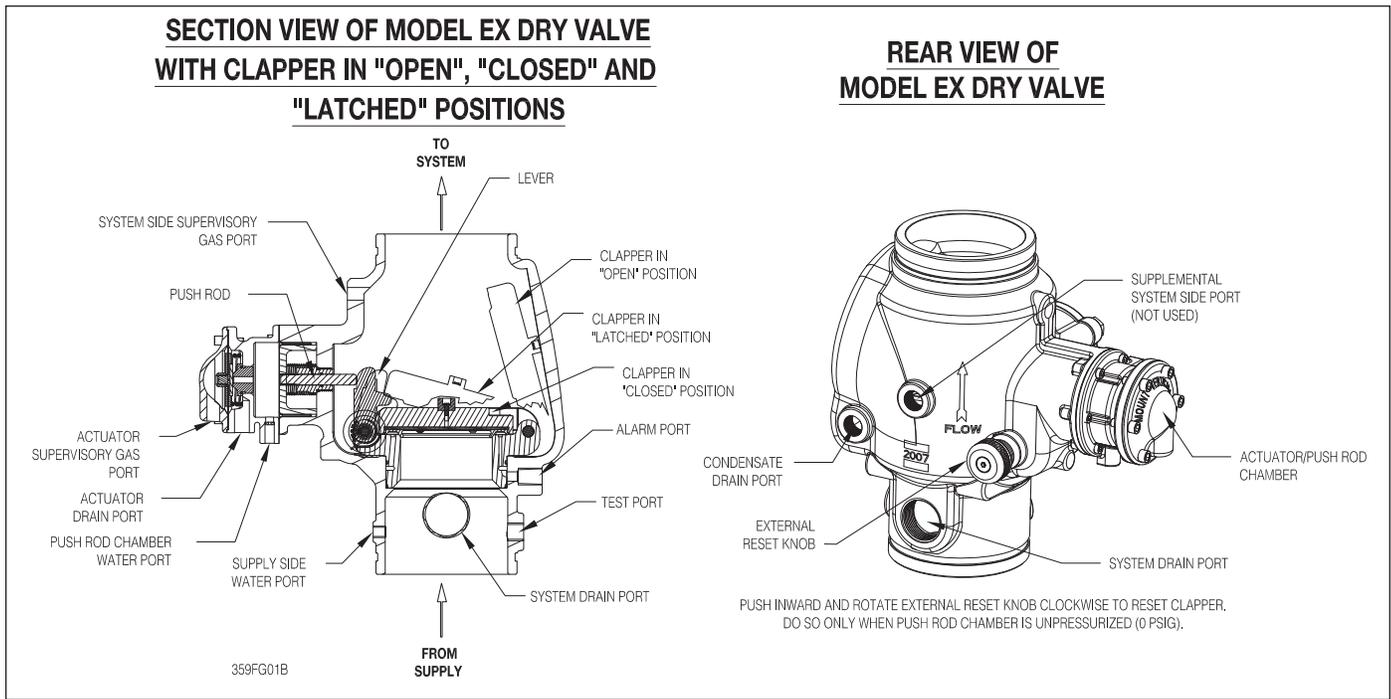


Fig. 1

The Model B Hydraulic Manual Emergency Station (see Fig. 5) is also included in the Model EX Low Pressure Dry Pipe Valve trim set. It consists of an aluminum nameplate mechanically attached to a ball valve. The valve handle in its OFF position is guarded against accidental turning to the ON position (and system discharge) by a nylon cable tie provided with each trim kit. The cable tie is inserted, as shown in Fig. 5, after the system has been restored for operation. The nylon cable tie is designed to allow, in case of an emergency, forceful turning of the valve handle to the ON position. As an alternative to the Model B Hydraulic Manual Emergency Station, the Model A Hydraulic Manual Emergency Pull Box (see Reliable Bulletin 506) is also available and can be provided as an option.

Whenever ambient temperature conditions are high, the water temperature in the Model EX Low Pressure Dry Pipe Valve's pushrod chamber could possibly increase, thereby increasing the pressure in the chamber to values exceeding the rated pressure of the system. In an indoor installation where standard room temperatures are exceeded, a pressure relief kit may be needed. Pressure relief kit, P/N 6503050001, can be installed into the pushrod chamber's releasing line to limit the pressure to 250 psi (17.2 bar).

Hydrostatic Testing of Model EX Dry Pipe Valves and Trims:

As required by NFPA 13, fire sprinkler systems with working pressures up to and including 150 psi are to be hydrostatically tested at a water pressure of 200 psi and maintain that pressure without loss for two hours. Fire sprinkler systems with working pressures above 150 psi are required to be hydrostatically tested at 50 psi above the system working pressure and maintain that pressure without loss for two hours. In addition to the hydrostatic tests described above, dry pipe systems require an additional low pressure air test.

In some cases, hydrostatic testing (in accordance with the NFPA 13 requirements noted above) will result in pressures that exceed the working pressure of the valve and trim kit for the two-hour test period. The valve and applicable trim kit have been tested, approved and listed under these conditions and as such, hydrostatic testing in accordance with NFPA 13 is acceptable. In addition, the clapper can remain in the closed position and the trim kit need not be isolated, as each has been designed to withstand hydrostatic testing as required by NFPA 13.

Hydrostatically testing the valve and trim to pressures higher than their rating is limited to the hydrostatic test as referenced by NFPA 13. It does not address the occurrence(s) of a "water hammer" effect, which can indeed damage the valve. A "water hammer" in the water supply piping of the valve can create pressures in excess of the rated pressure and should be avoided by all necessary means. This condition may be created from improper fire pump settings, underground construction work, or an improper venting of trapped air in the water supply piping.

Model EX Dry Pipe Valve System Engineering Specifications

Dry pipe sprinkler system shall be a [cULus Listed] [FM Approved] low-pressure dry pipe valve system capable of providing a 14:1 water-to-air force differential. Dry pipe valve shall consist of a lightweight, ductile-iron construction with a "screw in" stainless steel seat and clapper assembly utilizing an intermediate chamber design. Clapper facing shall be pressure-actuated, providing a compression seat for the sealing force between the clapper rubber facing and the valve seat. Push-rod chamber shall be of a piston/push-rod design with diaphragm seal and have a 1/4" vent hole for air/water leakage indication. Valve end connections shall be grooved ends per ANSI/AWWA C606 and/or flanged ends per ASME B16.5. Pneumatic actuation trim shall consist of all galvanized and brass trim,

Model EX Dry Pipe Valve Trim Parts List

Item No.	Part No. Galvanized	Description	QTY.
1	6101021010	Valve Assembly G/G 2" (50mm) - For 2" Assembly Only	1
	6101025010	Valve Assembly G/G 2½" (65mm) - For 2½" Assembly Only	
	6101031010	Valve Assembly G/G 3" (80mm) - For 3" Assembly Only	
	6101051010	Valve Assembly G/G 76mm - For 76mm Assembly Only	
	6101041010	Valve Assembly G/G 4" (100mm) - For 4" Assembly Only	
	6101061010	Valve Assembly G/G 6" (150mm) - For 6" Assembly Only	
	6101065010	Valve Assembly G/G 165mm - For 165mm Assembly Only	
	6101081010	Valve Assembly G/G 8" (200mm) - For 8" Assembly Only	
	6101041020	Valve Assembly F/G 4" (100mm) - For 4" Assembly Only	
	6101061020	Valve Assembly F/G 6" (150mm) - For 6" Assembly Only	
	6101041030	Valve Assembly F/F 4" (100mm) - For 4" Assembly Only	
	6101061030	Valve Assembly F/F 6" (150mm) - For 6" Assembly Only	
	6101081030	Valve Assembly F/F 8" (200mm) - For 8" Assembly Only	
2	6990003549	Butterfly Valve, 2" - For 2" G/G Assembly Only	1
	7M99002653	Butterfly Valve, 2½" - For 2½" G/G Assembly Only	
	7M99002654	Butterfly Valve, 3" - For 3" G/G Assembly Only	
	7M99002655	Butterfly Valve, 4" - For 4" G/G Assembly Only	
	7M99002656	Butterfly Valve, 6" - For 6" G/G Assembly Only	
	7M99002657	Butterfly Valve, 8" - For 8" G/G Assembly Only	
3	98020036	Conduit Body, ½"	1
4	98020033	Conduit Body Cover	1
5	98020034	Conduit Cover Gasket, Neoprene	1
6	98085692	Rigid Coupling, 2" - For 2" G/G Assembly Only	1 or 2
	98085693	Rigid Coupling, 2½" - For 2½" G/G Assembly Only	
	98085694	Rigid Coupling, 3" - For 3" G/G Assembly Only	
	98085695	Rigid Coupling, 4" - For 4" G/G Assembly Only	
	98085697	Rigid Coupling, 6" - For 6" G/G Assembly Only	
	98085698	Rigid Coupling, 8" - For 8" G/G Assembly Only	
7	91004002	Inlet Spool, 2" - For 2" G/G Assembly Only	1
	91004001	Inlet Spool, 2½" - For 2½" G/G Assembly Only	
	91004003	Inlet Spool, 3" - For 3" G/G Assembly Only	
	91004004	Inlet Spool, 4" - For 4" G/G Assembly Only	
	91004006	Inlet Spool, 6" - For 6" G/G Assembly Only	
	91004008	Inlet Spool, 8" - For 8" G/G Assembly Only	
8*	6999991340	System Sensor Pressure Switch UL/FM EPS40-2	1
	6999992361	System Sensor Pressure Switch ULC EPSA40-2	
	6990019313	Potter Pressure Switch PS25-2	
9*	6999991212	System Sensor Pressure Switch UL/FM EPS10-2	1
	6999992360	System Sensor Pressure Switch ULC EPSA10-2	
	6990006382	Potter Pressure Switch PS10-2	
10	98840190	Pressure Relief Valve (40 psi)	1
11	78653000	Manual Emergency Station Assembly	1

Item No.	Part No. Galvanized	Description	QTY.
12	78653004	Valve Caution Station Assembly	1
13	78653100	Ball Drip Valve, ½"	1
14	98840237	Ball Valve, ¼" NPTF x ¼" NPTM	1
15	98840103	Angle Valve, ½"	2
16	98840106	Angle Valve, 1¼" - For 2", 2½", 3" and 76mm Only	1
	98840100	Angle Valve, 2" - For 4", 6", 8" and 165mm Only	
17	98840188	Check Valve, ¼" NPTM x ¼" NPTF	1
18	96816904	Check Valve, Inline Popper, ½" NPT	2
19	98840145	Check Valve, Horizontal Swing, 1" NPT	1
20	98840147	Check Valve, Inline Popper, ¼"	1
21	92056810	Connector, 3/8" ID Tube x ½" NPT	2
22	92056704	Connector, Elbow, 3/8" ID Tube x ½" NPT	1
23	98050004	Drain Cup PVC	1
24	95306270	Drain Hose Clip	1
25	98174414	Elbow, 1¼" - For 2", 2½", 3" and 76mm Only	1
	98174405	Elbow, 2" - For 4", 6", 8" and 165mm Only	
26	96920912	Flex Line, ½"	1
27	96920944	Flex Hose, ¼" x 18"	2
28	98751002	Multi Port Fitting, ¾" x ½" x ¾" x ½" x ½" x ¼"	1
29	98751005	Multi Port Fitting, ¾" x ½" x ½" x ½" x ½"	1
30	98543226	Nipple ¼" x 1½"	4
31	98543217	Nipple ¼" x 6"	1
32	98543223	Nipple ½" x 1½"	11
33	98543209	Nipple ½" x 2"	2
34	98543263	Nipple 1" x 2" - For 2", 2½", 3" and 76mm Only	2
	98543266	Nipple 1" x 3½" - For 4", 6", 8" and 165mm Only	
35	98543250	Nipple 1¼" x 4" - For 2", 2½", 3" and 76mm Only	1
	98543262	Nipple 2" x 3½" - For 4", 6", 8" and 165mm Only	
36	98543285	Nipple 1¼" x Close - For 2", 2½", 3" and 76mm Only	1
	98543238	Nipple 2" x Close - For 4", 6", 8" and 165mm Only	
37	98543250	Nipple 1¼" x 4" - For 2", 2½", 3" and 76mm Only	1
	98543262	Nipple 2" x 3½" - For 4", 6", 8" and 165mm Only	
38	96686756	PVC Tubing, 3/8" ID x 6 ft.	1
39	98048000	Reducer Bushing, ½" x ¼"	1
40	98048022	Reducer Bushing, ¾" x ½"	2
41	98048015	Reducer Bushing, 2" Spigot x 1" NPTF PVC	1
42	89141112	Retaining Tie	9
43	98614403	Square Head Plug, ¼"	3
44	98604406	Square Head Plug, ½"	2**
45	98614401	Square Head Plug, ¾"	2
46	98727607	Strainer, ¼"	1
47	98174408	Street Elbow, ¼"	2
48	98174400	Street Elbow, ½"	2
49	98174416	Street Elbow, 1"	1
50	98761649	Tee, ½" x ¼" x ½"	2
51	98761651	Tee, ½"	1
52	96606630	Tee 1¼" x 1¼" x 1" - For 2", 2½", 3" and 76mm Only	1
	96606627	Tee 2" x 2" x 1" - For 4", 6", 8" and 165mm Only	
53	98815201	Union, ¼"	2
54	98815200	Union, ½"	2
55	98840160	Valve, 3-way, ¼"	3
56	96616601	Wye, ½"	1
57	98248000	Air Pressure Gauge (0-80 psi)	1
58	98248001	Water Pressure Gauge (0-300 psi)	2
59	95306255	Hose Clamp	3

*Note: Pressure switches not included with loose and segmentally assembled trims
 **Note: Quantity of 4 for loose and segmentally assembled trims to replace pressure switches



MODEL EX HYDRAULIC FRICTION LOSS GRAPH

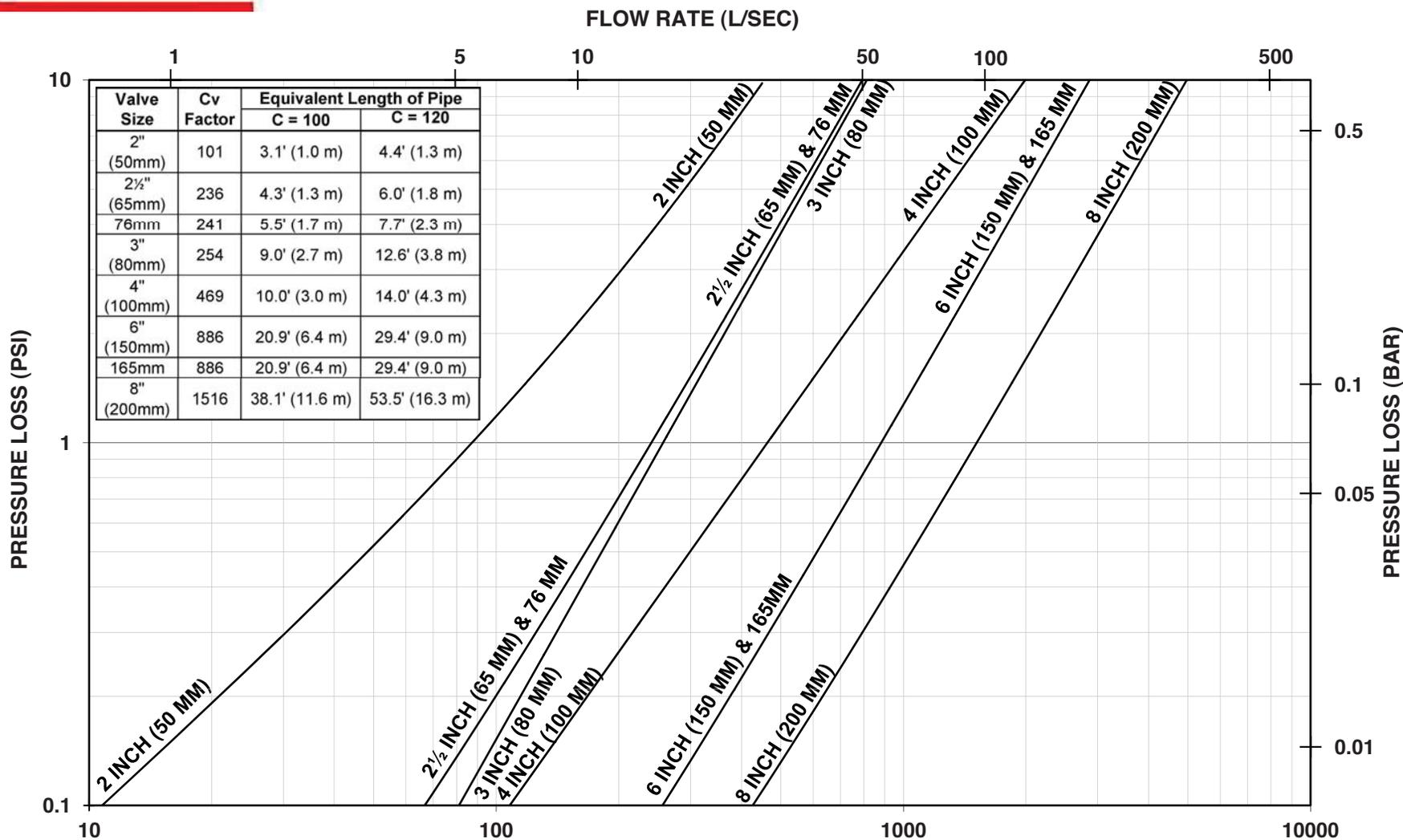


Fig. 3

RELIABLE MODEL B1 ACCELERATOR KIT (P/N 6516000003)

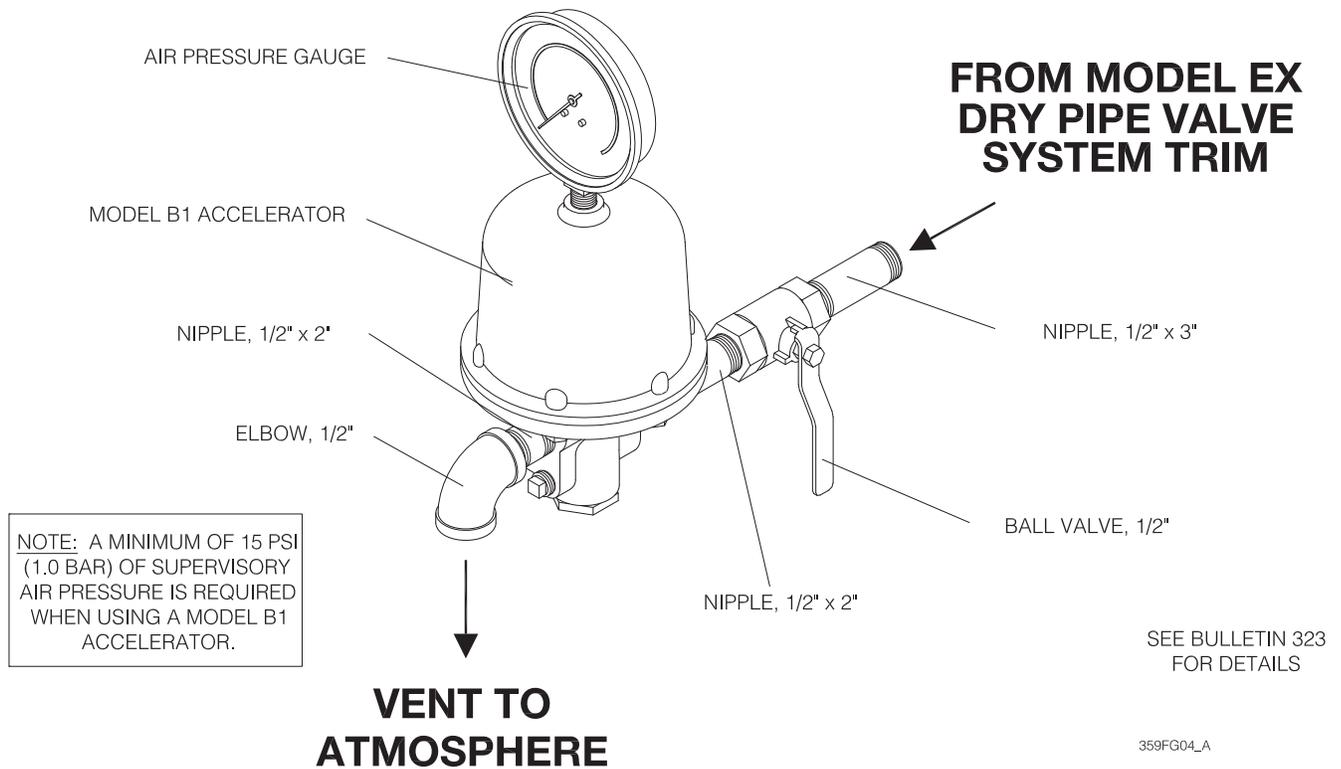


Fig. 4

including associated pressure gauges, main drain valve and emergency release valve. Dry pipe valve system air pressure shall only require between 8 and 28 psi (0.6 to 1.9 bar) for proper setting of the Dry Pipe in accordance with the manufacturer's instructions. Dry pipe valve shall be of the straight-through design to minimize friction loss, and be capable of being reset without having to remove the valve cover plate through the use of an external reset knob. Dry pipe valve shall actuate as a result of the loss of system air pressure caused by sprinkler activation. The low-pressure, pneumatic actuation shall utilize a diaphragm and compression spring design to separate the push-rod chamber water pressure from the system piping's pneumatic supervisory pressure.

Dry pipe valve system shall have a rated working pressure of 250 psi (17.2 bar) for 2" (50 mm), 2½" (65 mm), 76 mm, 3" (80 mm) and 8" (200 mm) valve sizes or 300 psi (20.7 bar) for 4" (100 mm), 165 mm and 6" (150 mm) valve sizes. Low-pressure dry pipe valve system shall be Reliable [2" (50 mm)][2½" (65 mm)][76 mm] [3" (80 mm)] [4" (100 mm)][165 mm][6" (150 mm)][8" (200 mm)] Bulletin 359.

Quick Opening Device (Accelerator) (Requires 15 psi Air Minimum)

As an option, the Model EX Dry Pipe Valve may be equipped with the Reliable Model B1 accelerator. The reliable Model B1 Accelerator with integral Accelo-Check (anti-flooding device) is designed to reduce the time required between the opening of at least one automatic fire sprinkler and the operation of the Model EX Dry Pipe valve.

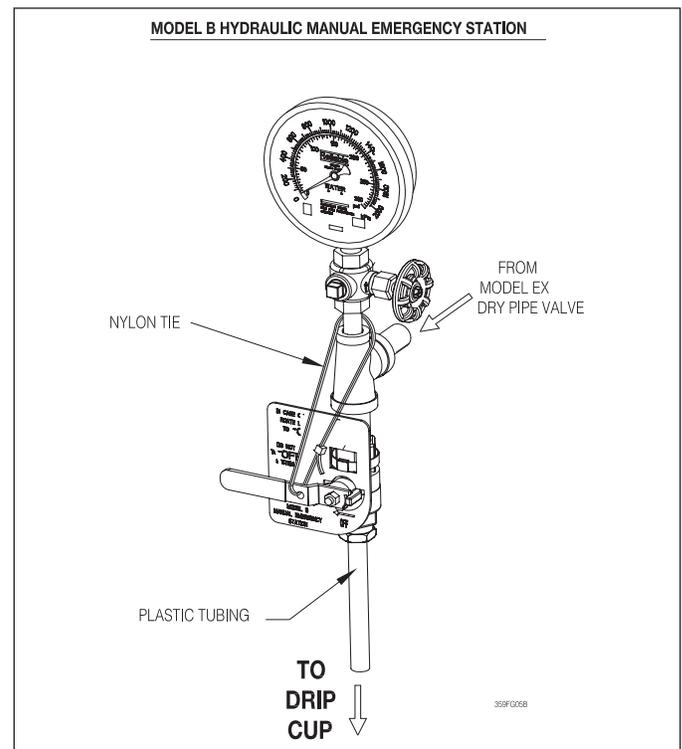


Fig. 5

By reducing the time between the sprinkler operation and the dry pipe valve operation, the water delivery time can be reduced. The required water delivery time is specified by the National Fire Protection Association (NFPA).

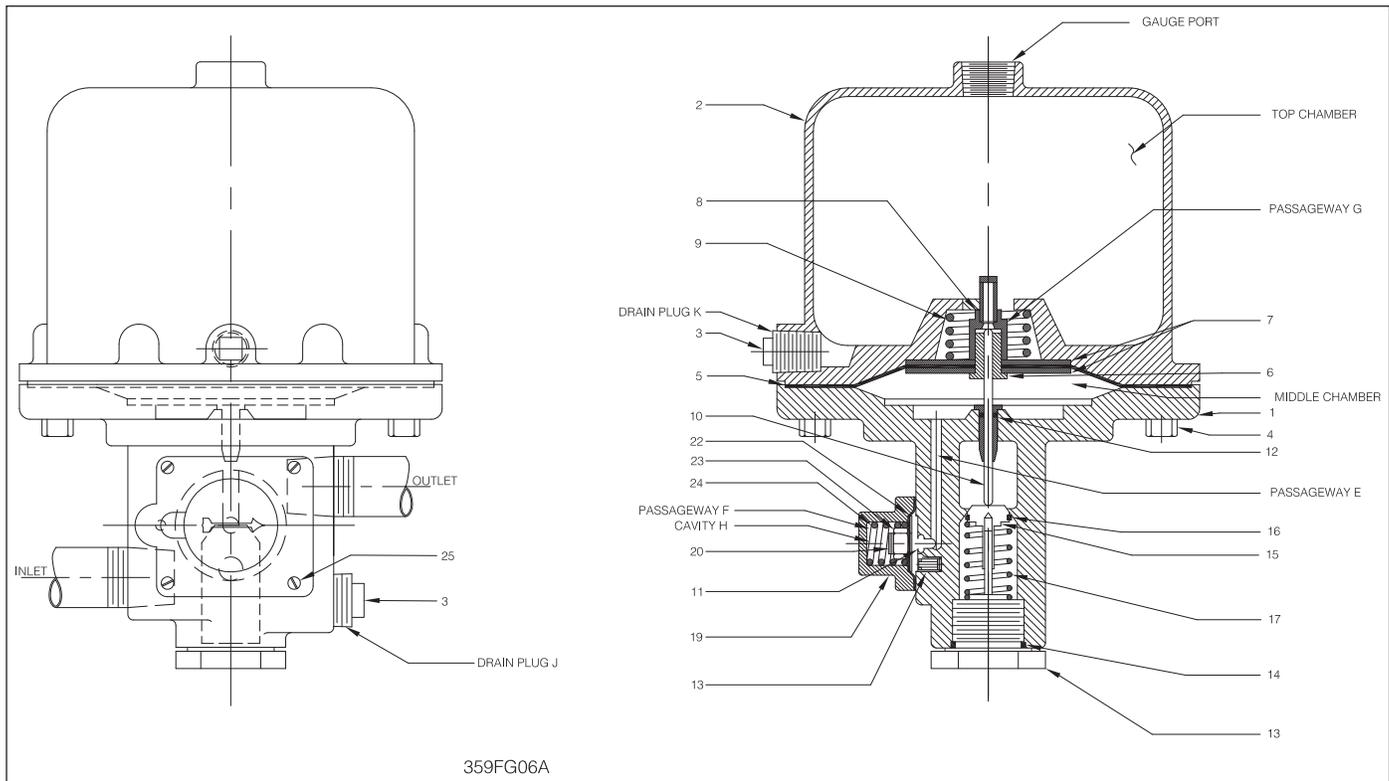


Fig. 6

Please note that the Model B1 Accelerator requires a minimum of 15 PSI to operate properly. When using the Model B1 Accelerator, the pressure supply MUST be from a constant pressure source such as a tank mounted air compressor or nitrogen bottles and regulated with the Reliable Model A-2 Pressure Maintenance Device.

Accelerator Operation

The Model B1 Accelerator is a normally closed valve with ½” NPT ports, and it is sensitive to a rate of air pressure change. This device retains normal dry system air pressure in the top chamber, see Fig. 6, even though the system air pressure may be dropping, such as when one or more sprinklers open. The resulting differential force created across the Diaphragm assembly (#5 thru #8, Fig. 6) forces the poppet (#15, Fig. 6) open, allowing system air pressure to be vented to atmosphere causing the Model EX Dry Pipe Valve to operate. Simultaneously, pressurized air passes through the accelerator and closes the integral Accelo-Check (#11 & #20 thru #24, Fig. 6) by pressurizing cavity H and preventing water and waterborne debris from entering the internal restriction area in passageway G. This increases the reliability of the device and reduces the maintenance which would otherwise be required to clean the accelerator after each operation.

Fig. 6 depicts the accelerator in the closed position while being pressurized. The accelerator is filled by air from the dry pipe system entering through the accelerator inlet, passing through the filter assembly and passageway E to the middle chamber. The air pressure lifts the diaphragm assembly off the pushrod (#10, Fig. 6) opening passageway G. The air then completely fills the top chamber to the system pressure. When filled, the diaphragm assembly resets on the pushrod end and closes passageway G, ex-

cept for minor leakage which is designed to compensate for air pressure fluctuations in the system.

Model B1 Accelerator Parts List

Item No.	Part No.	Description	No. Req.
1	91007000	Body/Push Rod Guide, Sub-Assy	1
2	92106411	Top Chamber Cover	1
3	98604413	Drain Plug ¼”	2
4	91106311	Top Chamber Bolt	6
5*	92206311	Sensing Diaphragm	1
6	95276321	Diaphragm Retainer	1
7	96906311	Diaphragm Washer	2
8*	92207000	Diaphragm Nut — Filter Sub-Assy	1
9	96406311	Diaphragm Spring	1
10*	95506307	Push-Rod	1
11*	95406311	‘O’ Ring, Accelo-Check	1
12*	95406315	‘O’ Ring, Push Rod Guide	1
13	73016333	Valve Plug Assembly	1
14*	95406312	‘O’ Ring, Valve Plug	1
15	95226321	Poppet	1
16*	95406313	‘O’ Ring, Poppet	1
17	96406314	Poppet Spring	1
18*	73016343	Filter Assembly	1
19	91006417	Accelo-Check Body	1
20	95226327	Accelo-Check Poppet	1
21	96906327	Accelo-Check Washer	1
22*	92206317	Accelo-Check Diaphragm	1
23	94906327	Accelo-Check Nut	1
24	96406317	Accelo-Check Spring	1
25	95606311	Accelo-Check Screw	4

* These items are contained in Replacement Parts Kit, Part No. 6888000100.

Maintenance

The following table provides a simplified, trouble shooting guide which indicates the necessary corrective maintenance for the more common problems which may occur.

Symptom	Probable Cause	Correction
Air Flows rapidly through Accelerator into outlet when resetting (air pressure at ball drip valve).	<ol style="list-style-type: none"> 1. Vacuum in middle chamber not allowing Accelerator to reset. 2. Pushrod held in down position by contamination, pushrod bent or pushrod guide too tight. 	<ol style="list-style-type: none"> 1. Vent middle chamber per Item 6 in Resetting Procedure Section. 2. Clean or replace as needed.
Minor air flow or leakage through Accelerator.	<ol style="list-style-type: none"> 1. Contamination in poppet area. 2. Poppet "O" ring has blown off poppet, or is cut. 3. Accelo-Check diaphragm has hole or rip allowing air to reach outlet through passageway F. 4. Leakage past pushrod guide "O" ring. 5. Pushrod or pushrod guide damaged causing leakage. 	<ol style="list-style-type: none"> 1. Clean. 2. Install new "O" ring. 3. Replace. 4. Replace. 5. Replace.
No or low air pressure top chamber (Gauge pressure does not increase, and no air pressure in outlet).	<ol style="list-style-type: none"> 1. Filter assembly clogged. 2. Restriction area (passageway G) clogged or filter on diaphragm nut clogged. 	<ol style="list-style-type: none"> 1. Replace. 2. Replace.
Accelerator will not trip during system test.	<ol style="list-style-type: none"> 1. Top chamber air pressure bleeding back to system too fast through restriction area. 2. Top chamber air pressure bleeding back to system through ripped diaphragm. 3. External leak in top chamber. 4. Filter assembly restricted. 	<ol style="list-style-type: none"> 1. Clean top of Push-Rod and mating surface in diaphragm nut or replace. 2. Replace. 3. Check gauge and drain plug for tightness—use new PTFE tape on plug after each resetting. 4. Replace.
Accelerator floods with water.	<ol style="list-style-type: none"> 1. Verify that the valve in accelerator outlet line is not closed preventing dry pipe intermediate chamber pressure from maintaining the Accelo-Check diaphragm in a closed position. 2. Accelo-Check "O" ring missing or cut. 3. Leakage past pushrod guide "O" ring. 4. Pushrod or pushrod guide damaged causing leakage. 5. Accelerator trim lines contain water. 6. Prime water level too high. 	<ol style="list-style-type: none"> 1. Replace with trimmings as specified. 2. Replace. 3. Replace. 4. Replace. 5. Drain and purge per resetting procedure. 6. Adjust. Relocate the accelerator's inlet system connection to the riser at least 2 ft. above the dry pipe valve.
Accelerator operates prematurely.	<ol style="list-style-type: none"> 1. Water or dirt in restriction area. 2. Air not bleeding back through restriction area to compensate for minor pressure fluctuations. 3. Dry pipe valve operating prematurely – not accelerator. 4. On-Off setting of compressor pressure switch allowing system pressure to decay too far. 5. Excessive system leakage. 	<ol style="list-style-type: none"> 1. Clean top of pushrod and mating surface—perform sensitivity test. 2. Replace pushrod and diaphragm nut – perform sensitivity test. 3. Review dry pipe valve bulletin and pressure settings. 4. Readjust differential of pressure switch to minimum (6–8 psi) when using accelerator. 5. Repair.

Model B1 Accelerator Installation

The Reliable Model B1 Accelerator is quickly attached to the Reliable Model EX 2" (50mm), 2½" (65mm), 3" (80mm), 76mm, 4" (100mm), 6" (168mm), 165mm or 8" (200mm) Dry Pipe Valve using the Reliable Accelerator trim (P/N 6516000003). No alterations to the sprinkler system piping are required for this installation. Fig. 2 & 4 depicts the trimmings and indicates the Model EX Dry Pipe Valve attachment points.

Reliable's Model B1 Accelerator is UL Listed and FM approved for system volumes up to 1500 gallons (5678 l).

It must be cautioned that accelerator operation and water delivery time at the inspectors test connection does not occur at the same time. There is a delay while the air is being expelled through the inspectors test connection ahead of the water. This time delay depends on the piping configuration, system size, available water supply pressure and other factors which are beyond the control of the accelerator and restrict the system's capability to deliver water within the 60 second time requirement. While field installation experience will aid in the determination of system size limitations, it is recommended that the Reliable Technical Service Department be consulted when large volume systems are encountered.

System Requirements

NFPA 13 titled "Installation of Sprinkler Systems" specifies that accelerators (quick opening devices) are required in dry systems having capacities of more than 500 gallons (1893 l). However, exceptions permit the omission of quick-opening devices for larger systems when water can be delivered to the inspector's test connection in less than 60 seconds.

Resetting Procedure (Model B1 Accelerator Requires 15 psi Air Minimum)

1. Close the 1/2" ball Valve Fig. 4
2. Close air and water supply valves to the dry pipe valve. Drain and reset the dry pipe valve in accordance with the section "Resetting the Model EX Dry Pipe Valve System" in this bulletin.
3. Reclose the main water supply control valve and reopen the dry pipe valve's drain valve.
4. Remove the Body Drain Plug J, Fig. 6.
5. Remove the Top Chamber Drain Plug K. If water is present in the top chamber, disassemble the accelerator, and clean and dry the top and middle chambers and diaphragm assembly using a clean lint free cloth. Reassemble the accelerator. Replace the top chamber drain plug using new thread sealant.
6. Remove the Accelo-Check Body (19), and gently lift the Accelo-Check Diaphragm Assembly (22) to verify venting of the middle chamber. Carefully reinstall these parts.
7. Partially open the 1/2" ball Valve Fig. 4, gently purging any water which may be in the trim lines. Close the 1/2" ball Valve Fig. 4 and replace the Body Drain Plug J, Fig. 2.
8. Pressurize the accelerator by opening the 1/2" ball Valve Fig. 4. The top chamber pressure should equal the system pressure.

9. Slightly open the main water supply control valve. Close the main drain valve when water flows, then fully open the main supply valve. The system is now ready for service.

Caution

The presence of water in the accelerator may cause premature operation. Therefore, it is imperative that after system operation, the accelerator be inspected for any signs of water in the top chamber and that the accelerator trim lines are purged prior to completing the accelerator reset procedure.

Test & Inspection

The following inspection should be performed on a weekly basis.

1. Check that the correct system air pressure has been set. (**Note:** 15 psi minimum required for proper operation of the Model B1 Accelerator)
2. Verify that accelerator top chamber pressure and system air pressure are equal.
3. Verify that the 1/2" ball Valve Fig. 4 is fully open.
4. Check that the condensate water is drained.
5. Check for leakage at the 1/2" elbow (Fig. 6).

Test

The following accelerator tests should be performed semi-annually or whenever the accelerator has been disassembled. **Note:** 15 psi minimum air pressure required for proper operation of the Model B1 Accelerator.

- A. Accelerator test without operating the dry pipe valve.
 1. Close the 1/2" ball Valve Fig. 4.
 2. Loosen the Body Drain Plug J, Fig. 2, to decay the pressure at the inlet of the accelerator. This will simulate a system decay as when one or more sprinklers open. The accelerator should operate.
 3. Reset the accelerator following the instructions described in the "Resetting Procedure" section items 3 through 8.
- B. Sensitivity Test
 6. Close the main water supply control valve.
 7. Bleed the system air pressure at a rate of 1 psi per minute by opening the condensate drain valve located on the dry pipe valve.
 8. After ten minutes (the air pressure should have decayed 10 psi) the accelerator should not have tripped.
 9. Restore the system air pressure and reopen the main water supply control valve.

Accelerator Operating Time

Figure 7 provides an approximate graph of actual accelerator operating time versus system size when one sprinkler head opens. The time of operation of the accelerator is relatively unaffected by inlet pressures so the graph applies for all normal dry system pressures from 20 psi to 50 psi (1.4 bar to 3.4 bar). As described in the following section, water delivery time will significantly exceed the accelerator operating time shown in Figure 7.

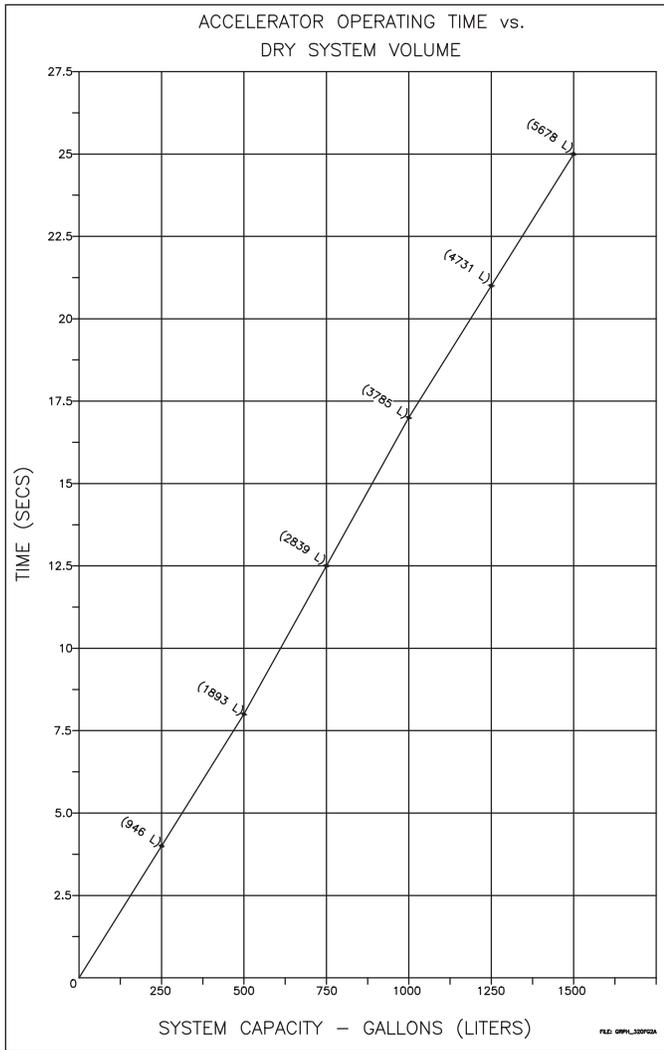


Figure 7

Note: 1 bar=100 kPa

Pneumatic Pressure Supply Options

Owner's Air Supply

Dry pipe valve system air pressure shall only require between 8 and 28 psi (0.6 to 1.9 bar) for proper setting of the Model EX Low Pressure Dry Pipe Valve in accordance with the manufacturer's instructions. Air supply shall be provided by an owner supplied air system in conjunction with a [cULus Listed] [FM Approved] automatic pressure maintenance device, capable of maintaining a constant system pressure regardless of pressure fluctuations in the compressed air source. The pressure maintenance device shall consist of galvanized trim and brass parts, including a strainer and a field adjustable air pressure regulator, and have a working pressure rating of 175 psi (12.1 bar). The pressure regulator shall have an adjustable outlet pressure range of 5 to 100 psi (0.34 to 6.8 bar). Pressure maintenance device shall be Reliable Model A-2.

Compressed Air Supply

Air supply shall be provided by an automatic air compressor or other continuous air supply sized for the capacity (volume) of the dry pipe system piping, and be capable of restoring normal air pressure in the system within the time limits specified by NFPA 13.

Dry pipe valve system air pressure shall only require between 8 and 28 psi (0.6 to 1.9 bar) for proper setting of the pneumatic actuator in accordance with the manufacturer's instructions. Air supply shall be equipped with an automatic pressure maintenance device capable of maintaining a constant system pressure. The pressure maintenance device shall consist of galvanized trim and brass parts, including a strainer and a field adjustable air pressure regulator or pressure switch, and have a working pressure rating of 175 psi (12.1 bar). The pressure regulator shall have an adjustable outlet pressure range of 5 to 100 psi (0.34 to 6.8 bar). Pressure maintenance device shall be Reliable Model A-2 or Reliable Model B1. (Note: For small systems with air compressors having a capacity less than 5.5 cfm @ 10 psi, a pressure maintenance device is not required per NFPA 13. Consideration should be given, however, the impact of a direct air supply on the overall performance of the system.)

Nitrogen

Nitrogen cylinders provided by an approved source shall provide the nitrogen supply. The nitrogen cylinder pressure shall be regulated and supervised through the use of a nitrogen regulating device and low pressure trim kit. This device shall consist of a brass, single stage regulator, equipped with high pressure inlet and low pressure outlet gauges, and 1/4" copper connection tubing with galvanized 3/4" x 1/4" reducer bushing. Optional: Low pressure trim kit shall be included to monitor the regulated nitrogen supply pressure to provide a low pressure supervisory alarm. This kit shall include a low pressure switch with associated galvanized connection trim. Assembly shall be a Reliable Nitrogen Regulating Device. This device is to be used in conjunction with the Reliable Model A-2 pressure maintenance device.

System Air/ Nitrogen Pressure Requirements

The system trim includes gauges to read the pneumatic and water pressures of the Model EX Low Pressure Dry System. Table A specifies the air or nitrogen pressure to be constantly applied to the system. A properly designed pneumatic supply system automatically regulates pressure, provides a safeguard against small pressure leaks in the sprinkler piping, and properly restricts the flow of makeup air or nitrogen from the source.

When the optional Reliable Model B1 Accelerator is used to expedite water delivery time, and/or when a PS25-2 high/low pressure switch is used, the pneumatic pressure must not be less than 15 psi (1.0 bar).

Whenever multiple dry systems are supplied by a common air or nitrogen source, each system must have its own pressure maintenance device for individual maintenance of pressure (NFPA 13, 7.2.6.5).

Model A-2 Pressure Maintenance Device

Operation:

The Model A-2 Pressure Maintenance Device (PMD) is designed for use where a source of compressed air (plant air system, tank mounted air compressor with a pressure control, etc.) or nitrogen cylinder (equipped with a regulating device) is available (refer to the section in this technical bul-

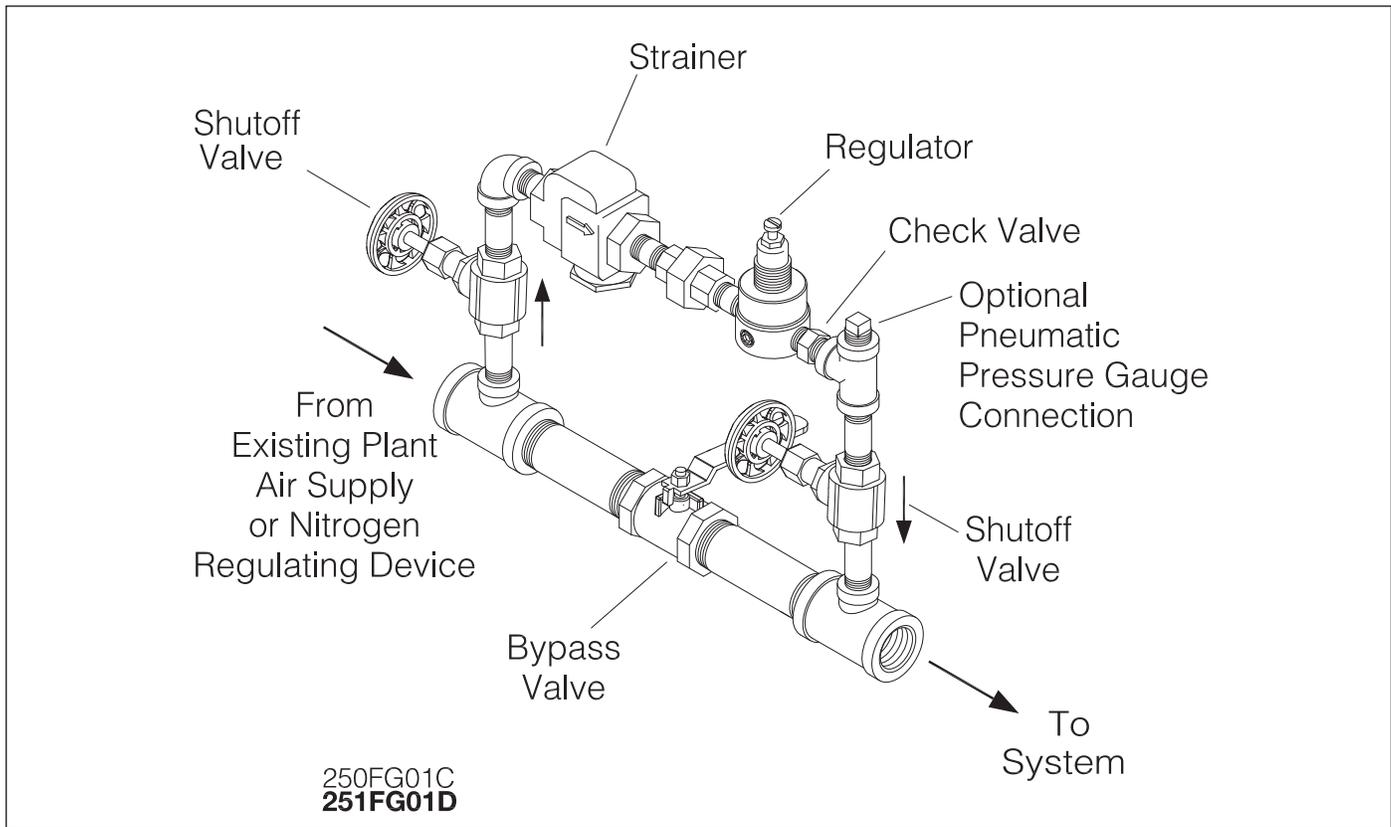


Fig. 8

Model A-2 Pressure Maintenance Device parts List

P/N 6304000135, (Steel pipe fittings are galvanized)

Item No.	Part No.	Description	No. Req'd
1	98681630	Regulator, 5-100 psi	1
2	98727606	Strainer, 1/4" NPT, 90	1
3	96816902	Check Valve, 1/4"	1
4	98840172	Globe Valve, 1/4"	2
5	98840108	Ball Valve, 3/4"	1
6	98815201	Union, 1/4"	1
7	96606616	Tee, 3/4" x 3/4" x 1/4"	2
8	98543234	Nipple, 3/4" x 3 1/2"	1
9	98543226	Nipple, 1/4" x 1 1/2"	5
10	98174404	Elbow, 1/4"	1
11	98543268	Nipple, 1/4" x Close	2
12	96606608	Tee, 1/4"	1
13	98614403	Plug, 1/4"	1
14	98543231	Nipple, 3/4" x 3"	1

Note: the locknut of the regulator (#1, Fig. 8) must be tightened after adjusting in order to prevent an accidental change in the pressure setting.

letin titled "Installation of the A-2 Pressure Maintenance Device"). The regulator in the Model A-2 PMD reduces higher pressure air or nitrogen to a level required by the Model EX Dry Pipe Valve. The Model A-2 PMD will maintain a constant pressure in the system regardless of any pressure fluctuations from the compressed air or nitrogen source.

Basic Functionality of Components
(refer to Figure 8):

The strainer's function is to prevent any foreign debris that may be present in the air supply, from traveling to the regulator and the check valve, thereby ensuring their normal op-

eration. The check valve's function is to prevent the reverse flow of water resulting from the Model EX Dry Pipe Valve operation, from reaching the regulator. The shutoff valves allow for the servicing (if needed) of the strainer and regulator without having to shut down the sprinkler system. The bypass valve permits the rapid restoration (quick-fill) of the required system air pressure after service or operation. The bypass valve must be closed and the shutoff valves must be open for proper automatic operation.

Adjustment of Model A2 Pressure Maintenance Device

The pressure regulator (Fig. 8) is factory set to maintain a nominal system air or nitrogen pressure of 30 psi (2.1 bar). In order to change the outlet pressure, loosen the locknut at the top of the regulator and turn the adjustment screw clockwise to increase pressure. To decrease the pressure, turn the adjusting screw counter clockwise. The resulting pressure can be determined at the sprinkler air gauge once the air flow through the device has ceased, or at the optional gauge location shown on Figure 8.

Adjustable Outlet Pressure Range:

- 5 psi to 100 psi (0.34 bar to 6.8 bar)
- Maximum Inlet Pressure: 175 psi (12 bar)

Inspection and Maintenance of the Model A-2 Pressure Maintenance Device:

Refer to figure 8

1. Review the latest NFPA 13 and NFPA 25 Standards and the section in this bulletin titled "Installation of the Model A-2 Pressure Maintenance Device" to ensure that the Model A-2 pressure maintenance device is installed properly.

2. Make sure that both 1/4" Shutoff Valves are open and that the 3/4" Bypass Valve is closed
3. Check the gas pressure in the Model EX dry pipe valve at the pressure gauge (#54, Fig. 2). See the section titled "Adjustment of the Model A-2 Pressure Maintenance Device" if any adjustments are required.
4. If maintenance is to be performed on the Regulator, Strainer or Check Valve of Fig. 8 of the pressure maintenance device, make sure that both Shutoff Valves are closed and that pressure has been relieved from the section through the 1/4" union. These valves must be opened again in order to restore proper automatic operation.
5. The strainer should be cleaned periodically to prevent contamination from blocking air flow. This can be done by removing the strainer's cap and wiping or blowing off any collected debris.
6. Make sure the check valve is installed according to the schematic with the arrow on its hexagonal side pointing in the required direction of air flow.
7. If the regulator in the Model A-2 pressure maintenance device is constantly leaking at the adjusting screw, the regulator may contain dirt keeping the poppet open and should be cleaned or replaced.

Table A (For the fastest water transit time, use no more than the "Best Performance Max" pneumatic pressure)

Water Pressure psi (bar)	Pneumatic Pressure to be Pumped into Sprinkler System psi (bar)	
	Maximum	Best Performance Max
20 (1.4)	8 (0.6)	10 (0.7)
30 (2.1)	10 (0.7)	14 (1.0)
50 (3.4)	12 (0.8)	16 (1.1)
75 (5.2)	13 (0.9)	17 (1.2)
100 (6.9)	15 (1.0)	19 (1.3)
125 (8.6)	16 (1.1)	20 (1.4)
150 (10.3)	17 (1.2)	21 (1.4)
175 (12.1)	18 (1.2)	22 (1.5)
200 (13.8)	19 (1.3)	23 (1.6)
225 (15.5)	21 (1.4)	25 (1.7)
250 (17.2)	22 (1.5)	26 (1.8)
275 (19.0)	23 (1.6)	27 (1.9)
300 (20.7)	24 (1.7)	28 (1.9)

Note: The dew point of the air supply must be maintained below the lowest ambient temperature to which the dry pipe system will be exposed. Introduction of moisture into the system piping exposed to freezing temperatures can create ice blockage, which could prevent proper system operation. As a minimum, the supply of air should be taken from the area of lowest temperature within the protected area. The air supply system must be carefully designed to prevent plugging by frost deposits. Special requirements, such as those in FME&R's "Installation Guidelines for Refrigerated Storage" may need to be incorporated.

Nitrogen used in refrigerated area systems minimizes a possibility of ice buildup and blockage inside the system piping that could inhibit proper system operation. The dewpoint of nitrogen compressed to 20 psig (1.4 bar) pressure is -46°F (-43°C), and -52°F (-47°C) when compressed to 10 psig (0.7 bar). High pressure nitrogen cylinders can typically be rented from a local source, with rental fees varying by supplier and cylinder sizes. Typical cylinders are described in Table B. The calculated nitrogen supply in lbs (kg) to pressurize various system capacities to 10 psi (0.7 bar) at different freezer temperatures is shown in Table C.

Table B

Cylinder Size	"Q"	"S"	"K"	"T"
Nitrogen Weight lbs. (kg)	5.50 (2.50)	10.28 (4.68)	16.51 (7.50)	22.01 (9.98)
Nitrogen Volume ft3 (m3)	76 (2.2)	142 (4.0)	228 (6.5)	304 (8.6)
Pressurized at psi (bar)*	2200 (151.7)	2200 (151.7)	2200 (151.7)	2200 (151.7)

Note: Initial pressure and thus nitrogen weight and volume can vary slightly. Check with your local supplier.

Table C

System Capacity Gal. (L)	Freezer Temperature, °F (°C)					Approx. fill Time (min)*
	20° (-6.7°)	0° (-18°)	-20° (-29°)	-40° (-40°)	-60° (-51°)	
250 (946)	1.90 (0.86)	1.90 (0.86)	2.00 (0.90)	2.10 (0.95)	2.20 (1.00)	1
500 (1891)	3.64 (1.65)	3.80 (1.72)	4.00 (1.81)	4.20 (1.91)	4.40 (2.00)	2
750 (2840)	5.50 (2.50)	5.70 (2.60)	6.00 (2.72)	6.30 (2.86)	6.60 (3.00)	3
1000 (3785)	7.30 (3.30)	7.60 (3.44)	8.00 (3.62)	8.33 (3.78)	8.80 (4.00)	4

Note: To obtain required nitrogen supply (lbs) for 15 psi (1.0 bar) or 22 psi (1.5 bar), multiply the tabulated values by a factor of 1.5 or 2.2 respectively.

(1 bar = 100 kPa)

* When filled with the Reliable Model A-2 Pressure Maintenance Device having the bypass valve open.

Installation of the Model A-2 Pressure Maintenance Device:

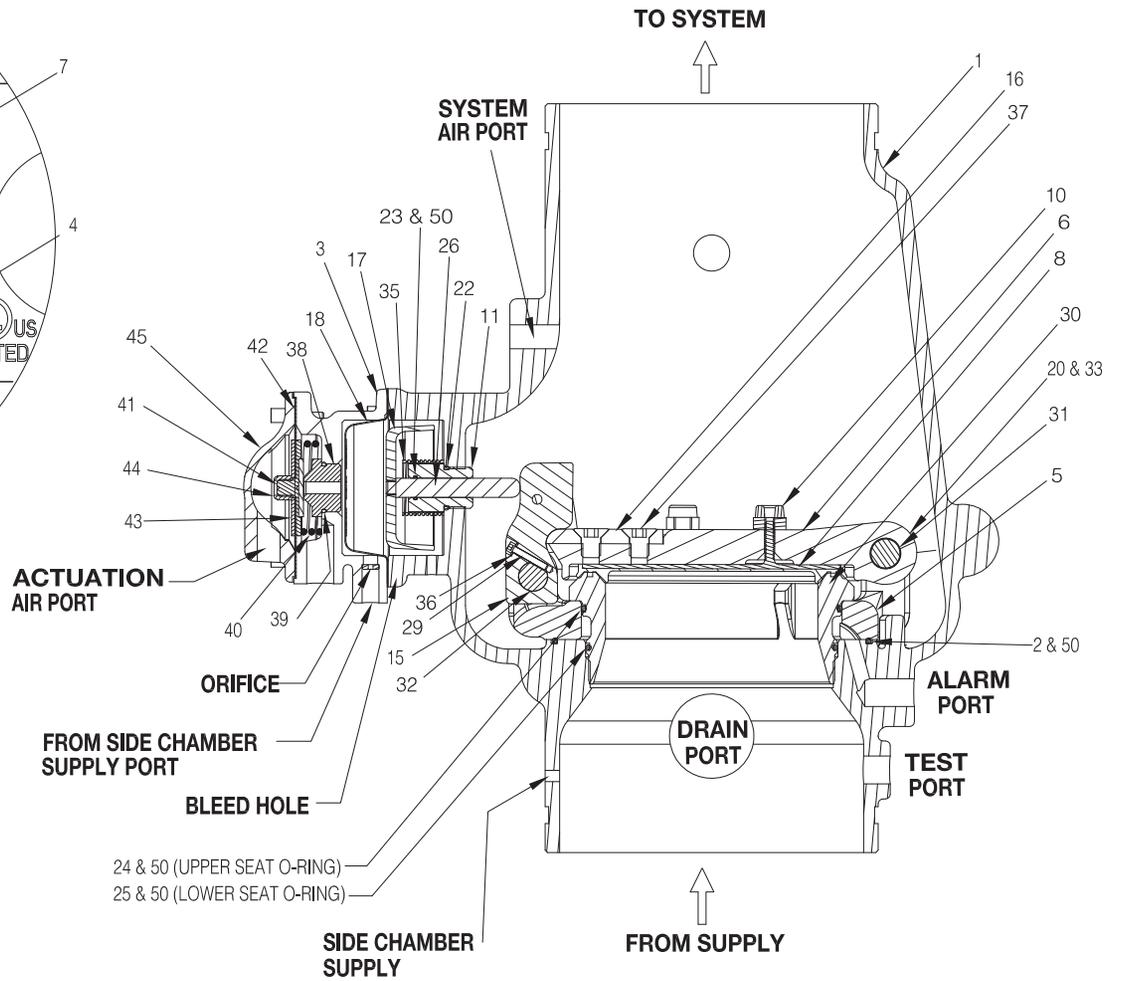
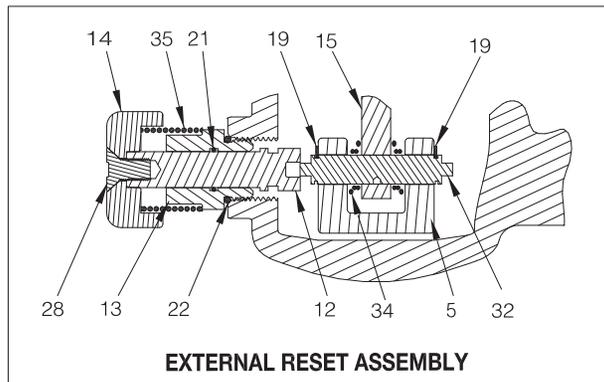
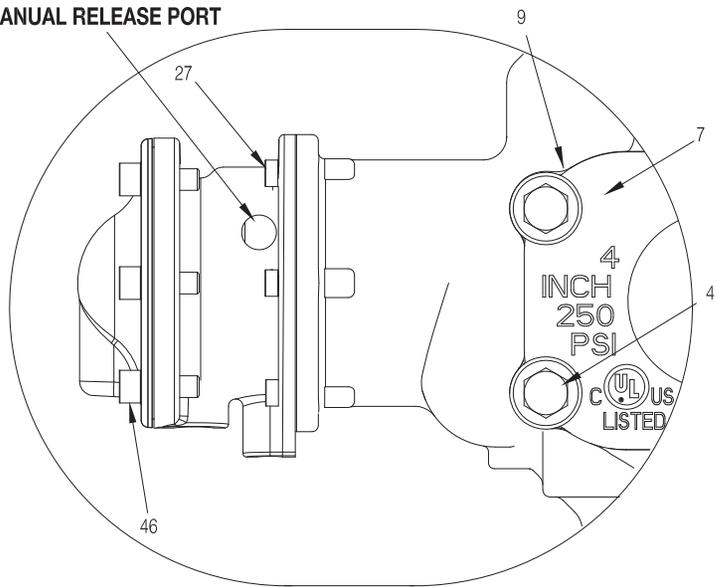
As shown in Fig.11, the Model A-2 pressure maintenance device is installed in the air supply leading to the Model EX Dry Pipe Valve. With the Model A-2 Pressure Maintenance Device the air supply is a tank mounted compressor with a pressure control switch, or a Nitrogen supply equipped with a regulating device. An extra outlet connection is provided for mounting an optional pressure gauge to monitor the outlet pressure.

To install the Model A-2 Pressure Maintenance Device, follow the instructions below:

- a) Make sure the air flow through the Model A-2 Pressure Maintenance Device is as shown by the arrows in Figs. 8 & 11

MODEL EX DRY PIPE VALVE

MANUAL RELEASE PORT



14.

359FG09B

Fig. 9

Model EX Dry Pipe Valve Parts List

Item No.	Part No.								Part Description	QTY.	Material
	2" (50mm)	2½" (65mm)	76mm	3" (80mm)	4" (100mm)	165mm	6" (150mm)	8" (200mm)			
1	91006011	91006012	91006023	91006013	91006005	91006027	91006007	91006028	Valve Body Groove/Groove	1	Ductile Iron 65-45-12
	N/A	N/A	N/A	N/A	91006045	N/A	91006067	N/A	Valve Body Flange/Groove		
	N/A	N/A	N/A	N/A	91006035	N/A	91006037	91006039	Valve Body Flange/Flange		
2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	95406414	O-ring (Mounting Ring)	1	Buna-N
3	71040417								Middle Housing Assembly	1	Ductile Iron 65-45-12 & Brass C360000
4	91106123			N/A	N/A	N/A	Hex Bolt ½"-13 x 1¼"		6	Zinc Plated Steel	
	N/A			95606107	N/A	N/A	Hex Bolt ½"-13 x 1½"		6	Zinc Plated Steel	
	N/A			N/A	91106006	N/A	Hex Bolt 5/8"-11 x 1¾"		6	Zinc Plated Steel	
	N/A			N/A	N/A	95606110	Hex Bolt 5/8"-11 x 2"		8	Zinc Plated Steel	
5	91306013			91306014	91306016	91306018	Mounting Ring		1	Stainless Steel CF8 or CF8M	
6	91916013			91916014	91916016	91916008	Clapper		1	Stainless Steel CF8 or CF8M	
7	92116063			92116064	92116065	92116066	Access Cover		1	Ductile Iron 65-45-12	
8	93416003			93416014	93416016	93416008	Seal Assembly		1	Stainless Steel 304 & EPDM	
9	93706003			93706004	93706006	93706008	Access Cover Gasket		1	Buna-N or Neoprene	
10	93722000			93722000	N/A	N/A	Bumpstop Assembly		1	Stainless Steel UNS S31600 & EPDM	
	N/A			N/A	93722000	N/A					
	N/A			N/A	N/A	93722000					
11	93916006			Pushrod Guide		1		Acetal			
12	93916066			Reset Shaft		1		Brass UNS C36000			
13	94106066			Reset Housing		1		Brass UNS C36000			
14	94356006			Reset Knob		1		Aluminum 6061			
15	94506003			94506004	94506016	94506008	Lever		1	Stainless Steel UNS S17400	
16	95006414			94006412	95006410	95006410	Striker		1	Aluminum Bronze C95400	
17	95106006			Piston		1		Stainless Steel CF8M			
18	95276006			Diaphragm		1		EPDM & Polyester			
19	95306267			N/A	N/A	N/A	Retaining Ring, 3/8" Shaft, Lever Pin		2	Stainless Steel 15-7 or 17-7	
	N/A			95306267	N/A	N/A	Retaining Ring, ½" Shaft, Lever Pin				
	N/A			N/A	95306269	N/A	Retaining Ring, 5/8" Shaft, Lever Pin				
	N/A			N/A	N/A	95316408	Retaining Ring, ¾" Shaft, Lever Pin				
20	95306267			N/A	N/A	N/A	Retaining Ring, 3/8" Shaft, Hinge Pin		2	Stainless Steel 15-7 or 17-7	
	N/A			95306267	95306267	N/A	Retaining Ring, ½" Shaft, Hinge Pin				
	N/A			N/A	N/A	95316408	Retaining Ring, ¾" Shaft, Hinge Pin				
21	95406007			O-Ring, Reset Housing ID		1		Buna-N			
22	95406024			O-Ring, Reset Housing & Pushrod Guide OD		2		Buna-N			
23	95406407			O-Ring, Pushrod Guide ID		1		Buna-N			
24	95406410			95406409	95436126	95406413	O-Ring, Upper Seat		1	Buna-N	
25	95406411			95406420	95446226	95406412	O-Ring, Lower Seat		1	Buna-N	
26	95506006			Pushrod		1		Stainless Steel UNS S30300			
27	95606114			Socket Head Screw, ¼"-20 x 5/8"		6		Steel			
28	95606127			Flat Head Socket Cap Screw 3/8"-16 x ¾"		1		Steel			
29	95606133			N/A	N/A	N/A	Socket Head Screw #6-32 x 1/2"		1	Stainless Steel 18-8	
	N/A			95606130	95606130	95606130	Socket Head Screw #10-32 x 1"		1	Stainless Steel UNS S31600	
30	96016003			96016014	96016016	96016008	Seat		1	Stainless Steel CF8M	
31	96206003			N/A	N/A	N/A	Hinge Pin		1	Stainless Steel UNS S30400	
	N/A			96216086	96216068	96206008			1	Stainless Steel UNS S21800	
32	96216003			N/A	N/A	N/A	Lever Pin		1	Stainless Steel UNS S17400	
	N/A			96216044	96216047	96216008			1	Stainless Steel UNS S21800	
33	96310003			96906904	96906904	96310008	Clapper Spacer		2	Teflon or Acetal	
34	96406003			N/A	N/A	N/A	Lever Spring		1	Stainless Steel UNS S30400	
	N/A			96406004	96406005	96406008			1	Stainless Steel UNS S31600	
35	96406906			Piston/ Reset Spring		2		Stainless Steel UNS S31600			
36	96906112			N/A	N/A	N/A	Spring Lock Washer, #6		1	Stainless Steel 18-8	
	N/A			96906111	96906111	96906111	Spring Lock Washer, #10		1	Stainless Steel UNS S31600	
37	95606140			N/A	N/A	N/A	Flat Head Socket Cap Screw ¼"-20 x 1/2"		2	Stainless Steel 18-8	
	N/A			95606139	N/A	N/A	Flat Head Socket Cap Screw ¼"-20 x 1/2"		1	Stainless Steel UNS S31600	
	N/A			N/A	N/A	95606135	Flat Head Socket Cap Screw 1/2"-13 x 3/4"		1	Stainless Steel UNS S31600	
38	96006905			Actuation Seat		1		Brass UNS C36000			
39	95406901			O-Ring, Actuation Seat		1		Buna-N			
40	96406902			Actuation Spring		1		Stainless Steel UNS S31600			
41	95106911			Actuation Facing Plate		1		Brass UNS C36000 & EPDM			
42	92206311			Actuation Diaphragm		1		EPDM			
43	96906311			Actuation Washer		1		Stainless Steel UNS S31600			
44	94906406			Actuation Locking Nut		1		Stainless Steel UNS S31600 & Nylon			
45	94106953			Side Cover		1		Ductile Iron 65-45-12			
46	95606147			Socket Head Screw, 3/8"-16 x 1"		6		Steel			
47	94616921			Knob Caution Label (Not Shown)		1		Polystyrene			
48	91556922			Ball Chain, 1/8" (Not Shown) (Qty. is Length in Inches)		6		Nickel Plated Brass			
49	91556923			Clamping Link, Ball Chain (Not Shown)		1		Nickel Plated Brass			
50	699993406			O-Ring Grease, Duponttm Krytox® GPL-205 (Not Shown)		A/R		Krytox®			

- b) Install the Model A-2 Pressure Maintenance Device as close to the Model EX Dry Pipe Valve air line trimmings as possible.
- c) Install Model A-2 Pressure Maintenance Device in an upright, horizontal position with the bypass valve on the bottom.

Optional System Accessories

System Control Valve

Dry pipe system control valve shall be a slow close, [cULus Listed][FM Approved] indicating butterfly type valve with a prewired supervisory tamper switch assembly. The valve shall be rated for a working pressure of [300 psi (20.6 bar)]. System control valve shall be a [2" (50 mm)] Gruvlok AN7722-3A Butterfly Valve; [2-1/2" (65 mm)][3" (80 mm)][4" (100 mm)][6" (150 mm)][8" (200 MM)] Reliable REL-BFG-300 Butterfly Valve.

Waterflow Alarm Pressure Switch

Alarm pressure switch shall be provided to indicate water flow and provide a water flow alarm. Pressure switch shall be [cULus][FM Approved] and of the bellows activated type enclosed in a weatherproof, NEMA 4/4X rated enclosure incorporating tamper-resistant screws.

High/Low Air Pressure Switch

A pressure supervisory alarm switch to monitor the reliability of the compressed air supply shall provide both a high and low pressure supervisory alarm. Pressure switch shall be [cULus][FM Approved] and of the bellows activated type enclosed in a weatherproof, NEMA 4/4X rated enclosure incorporating tamper-resistant screws. There shall be two sets of SPDT (Form C) contacts rated at 10.0 A @ 125/250 VAC and 2.5 A @ 6/12/24 VDC. The pressure switch shall have a maximum service pressure of 250 psi (17.2 bar) and an adjustable range of 10 to 60 psi (0,7 to 4.1 bar), factory set to respond at 28 psi (1.9 bar) rising pressure and 18 psi (1.2 bar) decreasing pressure. The switch shall be provided with a 1/2" NPT male pressure connection. High/Low pressure switch shall be Potter PS25-2.

For systems utilizing air or nitrogen pressure below 15 psi. It will be necessary to replace the PS25-2 low pressure switch with an PS10-2 switch, and utilize the "COM" and "2" contacts which are normally open under normal pressure.

Technical Valve Data:

1. Rated Working Pressure: 250 psi (17.2 bar) or 300 psi (20.6 bar) (4" (100mm, 165mm & 6" (150mm) ONLY)
2. Factory Tested Hydrostatic Pressure: 500 psi (34.4 bar) or 600 psi (41.2 bar) (4" (100mm), 165mm and 6" (150mm) ONLY)
3. End Connections: 2" (DN50) thru 8" (DN200) available in Groove-Groove Configuration. 4" (DN100) thru 6" (DN150) available in Flange-Groove 4" (DN100) through 8" (DN200) available in Flange-Flange.

- Grooved End dimensions:

Nominal Pipe Size	Outlet Diameter	Groove Diameter	Groove Width	Outlet Face to Groove
2" (50 mm)	2.375" (60mm)	2.250" (57mm)	11/32" (9.0mm)	5/8" (16mm)
2½" (65 mm)	2.875" (73mm)	2.720" (69mm)	11/32" (9.0mm)	5/8" (16mm)
76 mm	3.000" (76mm)	2.845" (72mm)	11/32" (9.0mm)	5/8" (16mm)
3" (80 mm)	3.500" (89mm)	3.344" (85mm)	11/32" (9.0mm)	5/8" (16mm)
4" (100 mm)	4.500" (114mm)	4.334" (110mm)	3/8" (9.5mm)	5/8" (16mm)
165 mm	6.500" (165mm)	6.330" (161mm)	3/8" (9.5mm)	5/8" (16mm)
6" (150 mm)	6.625" (168mm)	6.455" (164mm)	3/8" (9.5mm)	5/8" (16mm)
8" (200 mm)	8.625" (219mm)	8.441" (214mm)	7/16" (11mm)	3/4" (19mm)

- Threaded openings Per ANSI B 2.1
- Flange Dimensions

Flange Type:	Nominal Pipe Size	Bolt Circle Diameter	Bolt Hole Diameter	Flange Outside Diameter	Flange Thickness	Number of Bolts
ASME B16.5 Class 150	4" (100mm)	7½" (191mm)	¾" (19mm)	9" (229mm)	15/16" (24mm)	8
ISO 7005-2 PN16	4" (100mm)	7¾" (180mm)	¾" (19mm)	9" (229mm)	15/16" (24mm)	8
ASME B16.5 Class 150	6" (150mm)	9½" (241mm)	7/8" (22mm)	11" (279mm)	15/16" (24mm)	8
ISO 7005-2 PN16	6" (150mm)	9 7/16" (240mm)	29/32" (23mm)	11" (279mm)	15/16" (24mm)	8
ASME B16.5 Class 150	8" (200mm)	11¾" (298mm)	7/8" (22mm)	13½" (343mm)	1" (25.4mm)	8
ISO 7005-2 PN16	8" (200mm)	11 5/8" (295mm)	29/32" (23mm)	13½" (343mm)	1" (25.4mm)	12

4. Valve Exterior's Color:

Valve Size	Color
2" (50 mm)	Black or Red
2½" (65 mm)	Black or Red
76 mm	Red
3" (80 mm)	Black or Red
4" (100 mm)	Black or Red
165 mm	Red
6" (150 mm)	Black or Red
8" (200 mm)	Black or Red

5. Face to face dimensions:

Valve Size:	End Connection:	End to End:
2" (50mm), 2½" (65mm), 76mm & 3" (80mm)	Groove/ Groove	12½" (318mm)
4" (100mm)	Groove/ Groove	14" (356mm)
	Flange/ Groove	16" (406mm)
	Flange/ Flange	16" (406mm)
6" (150mm) & 165mm	Groove/ Groove	16" (406mm)
	Flange/ Groove	19" (483mm)
	Flange/ Flange	19" (483mm)
8" (200mm)	Groove/ Groove	19 3/8" (492mm)
	Flange/ Flange	21¼" (540mm)

6. Valve Shipping Weight:

Valve Size:	End Connection:	Weight:
2" (50mm), 2½" (65mm), 76mm & 3" (80mm)	Groove/ Groove	34 lbs (15 kg)
4" (100mm)	Groove/ Groove	64 lbs (29 kg)
	Flange/ Groove	79 lbs (36 kg)
	Flange/ Flange	92 lbs (42 kg)
6" (150mm) & 165mm	Groove/ Groove	95 lbs (43 kg)
	Flange/ Groove	122 lbs (56 kg)
	Flange/ Flange	138 lbs (69 kg)
8" (200mm)	Groove/ Groove	148 lbs (67 kg)
	Flange/ Flange	197 lbs (90 kg)

7. Trim Shipping Weight:

Valve Size:	Weight:
2" (50mm), 2½" (65mm), 76mm & 3" (80mm)	30 lbs (13.6 kg)
4" (100mm), 6" (150mm), 165mm & 8" (200mm)	34 lbs (15.5 kg)

8. Friction loss (Expressed in equivalent length of Schedule 40 pipe, based on Hazen & Williams formula:

Valve Size:	Equivalent Length:		Cv
	C = 120	C = 100	
2" (50mm)	4.4 ft (1,3 m)	3.1 ft (1,0 m)	101
2½" (65mm)	6.0 ft (1,8 m)	4.3 ft (1,3 m)	236
76mm	7.7 ft (2,3 m)	5.5 ft (1,7 m)	241
3" (80mm)	12.6 ft (3,8 m)	9.0 ft (2,7 m)	254
4" (100mm)	14 ft (4,3 m)	10 ft (3,0 m)	469
165mm	29.4 ft (9,0 m)	20.9 ft (6,4 m)	886
6" (150mm)	29.4 ft (9,0 m)	20.9 ft (6,4 m)	886
8" (200mm)	53.5 ft (16,3 m)	38.1 ft (11,6 m)	1516

9. Installation position: Vertical

Valve Installation

Proper operation of the Reliable Model EX dry pipe valve is dependent upon the proper installation of its trim in accordance with the instructions given in this bulletin. Failure to follow the appropriate trim diagram may prevent the Model EX dry pipe valve from operating properly, as well as void listing, approvals and the manufacturer's warranties.

The Model EX dry pipe valve must be installed in a readily visible and accessible location.

The Model EX dry pipe valve and associated trim must be maintained at above a minimum temperature of 40°F (4°C).

Heat tracing of the Model EX dry pipe valve or its associated trim is not permitted. Heat tracing can result in the formation of hardened mineral deposits that are capable of preventing proper operation of the dry pipe valve.

The Model EX dry pipe valve is to be installed in accordance with the following criteria:

- All nipples, fittings and devices must be clean and free of burrs and scale prior to installation. Pipe thread sealant to be used sparingly and on male threads only
- Care must be taken to ensure that check valves, strainers, globe valves etc. are installed in the proper direction as indicated by the flow arrows.
- Drain tubing to the drip cup must be installed with smooth bends as to not restrict the flow through the tubing.

- Suitable provisions must be made for the disposal of drain water. Drainage water must be directed such that it will not cause accidental danger to persons or damage to property.
- Unused pressure alarm switch and/or water motor alarm connections must be plugged.
- The pressure relief valve provided with the dry pipe valve trim is factory set to relieve at a pressure of approximately 33 psi (2.3 bar) which can typically be used for a maximum normal system air pressure of 28 psi (1.9 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 removing the cap nut on the end of the relief valve (#6 Fig. 2) and turning the now exposed slotted adjusting screw accordingly, ie clockwise to increase the pressure setting and counterclockwise to decrease the pressure setting. After verifying the pressure setting of 5 psi (0.34 bar) above the maximum system air pressure required by Table A, replace and tighten the cap nut.
- Installation of an air maintenance device, as described in the "Installation of a Model A-2 Pressure Maintenance Device" section of this bulletin is recommended.
- An inspectors test drain as required by NFPA 13 must be provided on the system piping at the most remote location from the Model EX dry pipe valve.
- Conduit and electrical connections are to be made in accordance with the requirements of the Authority Having Jurisdiction and/or the National Electric Code.

The Model EX dry pipe valve uses eleven tapped openings for trim connections. Each opening and its function are indicated on Fig. 2. Using Fig. 2 as reference, the recommended trim installation is as follows:

- 1) Install ½" x 4" nipple (#28) in tapped opening marked "TEST" and install the attached trim components.
- 2) Install ½" x 1½" nipple (#26) in tapped opening marked "ALARM" and install the attached trim components.
- 3) Install ½" x 1½" nipple (#26) in tapped opening marked "SYSTEM" and install the attached trim components.
- 4) Install ¼" flex hose (#22) in tapped opening marked "AIR" and install the attached trim components.
- 5) Install ¾" x ½" Reducing Bushing (#38) in tapped opening marked "CONDENSATE" and install the attached trim components.
- 6) Install ½" x 2" nipple (#27) in tapped opening marked "RELEASE" and install the attached trim components.
- 7) Install ¼" flex hose (#22) in tapped opening marked "SUPPLY" and install the attached trim components.

- 8) Install ¼" check valve (#14) in tapped opening marked "IN" and install the attached trim components.
- 9) Install ½" barbed connector (#15) in tapped opening marked "OUT" and install the attached trim components.
- 10) Install ¾" plug (#43) in tapped opening marked "PLUG".
- 11) Install 1¼" x 4" for the 2" (50mm), 2½" (65mm), 76mm & 3" (80mm) valve sizes OR 2" x 3½" nipple for 4" (100mm), 6" (150mm) 165mm & 8" (200mm) valve sizes (#32) in tapped opening marked "DRAIN" and install the attached trim components.

- Close the Main Control Valve.
- Open the Main Drain Valve.
- Open the Main Control Valve one turn beyond the position at which water begins to flow from the Main Drain Valve.
- Close the Main Drain Valve.

Step 2. Open the system's Inspector's Test Connection.

Step 3. Verify that the Model EX dry pipe valve has opened, as indicated by the flow of water into the system and that all waterflow alarms operate properly.

Step 4. Close the system's Main Control Valve.

Step 5. Reset the Model EX dry pipe valve in accordance with the "Resetting the Model EX Dry Pipe Valve System" section in this bulletin.

Note: It is recommended that the requirements of NFPA 25 to annually inspect the inside of the valve be performed at this time and prior to the resetting of the Model EX dry pipe valve.

Maintenance

The Reliable Model EX Dry pipe valve and associated equipment shall periodically be given a thorough inspection and test. NFPA 25, Inspection, Testing and Maintenance of Water Based Fire Protection Systems, provides minimum maintenance requirements. These requirements include annual operation testing, inspection, cleaning and parts renewal as required, quarterly waterflow alarm testing, quarterly main drain flow testing, water and air pressure inspections.

Note: Any impairment of the Model EX dry pipe valve must be corrected immediately.

The owner is responsible for the inspection, testing and maintenance of their fire protection system and devices in compliance with this document, as well as applicable standards of the National Fire Protection Association (example, NFPA 25), in addition to the standards of any Authority Having Jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions.

It is recommended that automatic sprinkler systems be inspected, tested and maintained by a qualified inspection service.

Valve Testing Procedures

Notes: The operational test procedure and waterflow pressure alarm test procedure will 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 that 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 Model EX dry pipe valve (i.e. opening of the Model EX dry pipe valve during a fire condition) should be verified at least one a year as follows:

Step 1. If water must be prevented from flowing beyond the riser, perform the following steps. If water flow need not be prevented, continue to **Step 2.**

Quarterly Waterflow Alarm Test Procedure

Testing of the system waterflow alarms should be performed quarterly. To test the waterflow alarm, open the Alarm Test Valve (#23 Fig. 2), 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 (#23 Fig. 2).

Water Pressure Inspection

The water pressure gauge is to be inspected monthly (per NFPA 25) to ensure that normal system water pressure is being maintained.

Air Pressure Inspection

The Air Pressure Gauge is to be inspected monthly (per NFPA 25) to ensure that normal system air pressure is being maintained.

Automatic Drain Valve (Ball Drip) Inspection

The automatic Drain Valve should be inspected monthly (per NFPA 25) by depressing the plunger and checking to ensure that the Automatic Drain Valve is not discharging water and/or air. A discharge of water and/or air is an indication that the air and/or water seats are leaking, which could result in a false operation should the intermediate chamber become inadvertently pressurized.

If leakage is present, refer to the troubleshooting section of this bulletin for corrective action.

Valve and Trim Setup Checklist

1. Water supply – be sure that the valves controlling water supply to the Dry Pipe Valve are fully open and properly monitored.
2. Alarm Line – be sure that valve F (Fig. 10) is opened and remains in this position.
3. Other trimming valves – check that all of the pressure gauges ¼" 3-way valves are open. Valves D and J should be closed.
4. Ball Drip Valve (Automatic Drain Valve) – make sure valve F (Fig. 10) is open. Push in on the plunger to be sure the ball check is off the seat. If no water appears, the Dry Pipe Valve's seat is tight.

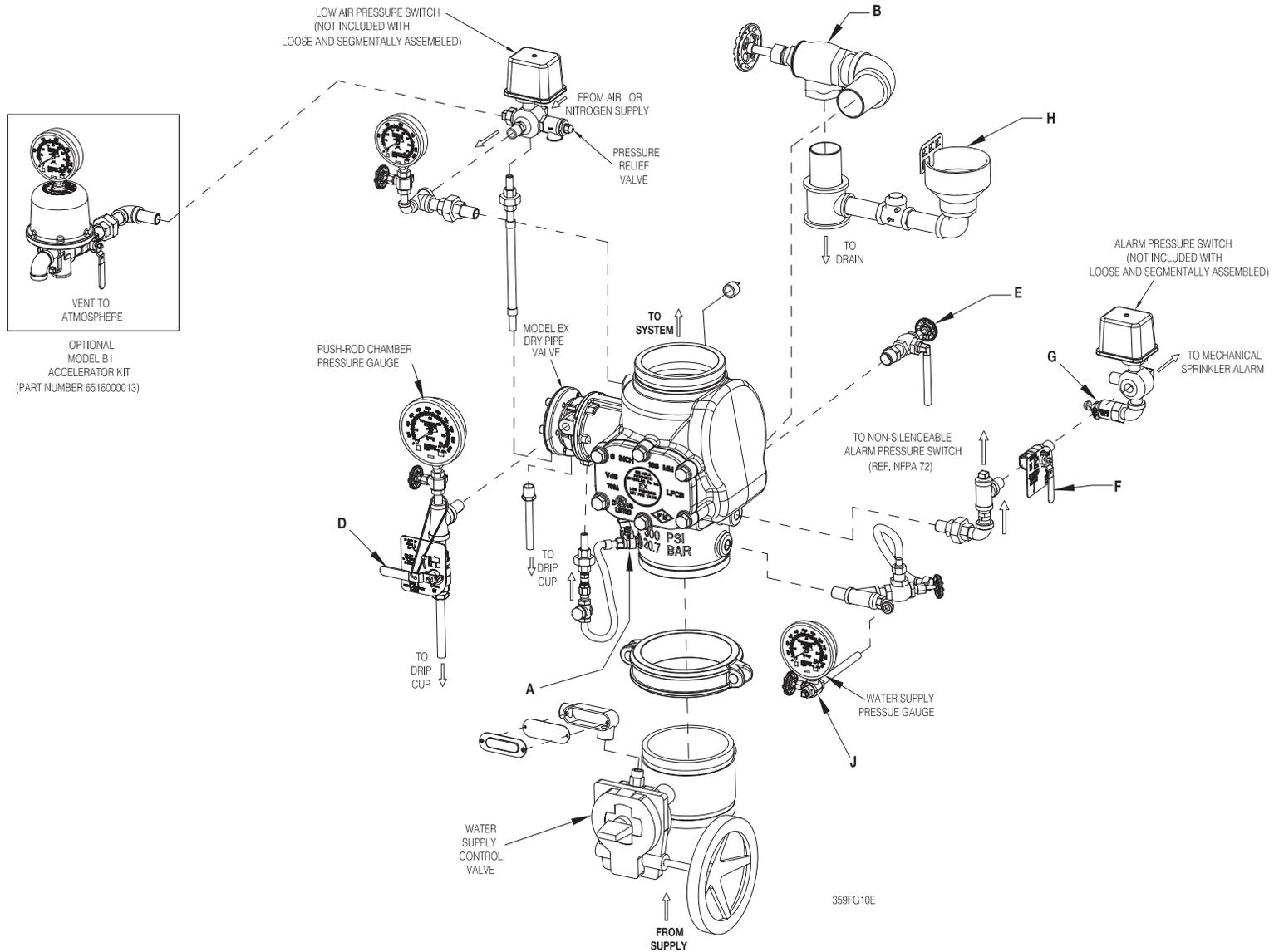


Fig. 10

5. System pneumatic pressure – check system air pressure gauge (Fig. 10) and water supply pressure gauge (Fig. 10) for conformance to Table A.

Resetting the Model EX Dry Pipe Valve System

Refer to Figures 10

1. Close the main valve controlling water supply to the Dry Pipe Valve and close off the air/nitrogen supply to the sprinkler system. Also, close pushrod chamber supply valve, valve A.
2. Open the main drain valve, valve B, and drain system.
3. Open all drain valves and vents at low points throughout the system, closing them when flow of water has stopped.
4. Inspect and replace any necessary portions of the sprinkler system subjected to fire conditions.
5. Open the Model B Manual Emergency Release, valve D.

Note: The above steps accomplish the relieving of pressure in the pushrod chamber of the Dry Pipe Valve.

6. With valve F (Alarm line) open, push in the plunger of ball drip valve, valve G, to force the ball from its seat, and drain any water in the alarm line.
7. With the Manual Emergency Release, Valve D, open, push in and rotate the Model EX's reset knob (#14, Fig. 9) clockwise until you hear a distinct clicking noise, indicating that the clapper has closed. **Note:** The reset knob can be rotated only while the pushrod chamber is vented to atmospheric conditions (0 psig).
8. Close valve A (Push Rod Chamber Supply, valve B (Main Drain), and valve F (Alarm Line).
9. Rapidly apply compressed air or nitrogen into the Model EX Dry Valve and the system until the pressure conforms to Table A levels, as indicated on the system air pressure gauge.
10. Open valve A (Push Rod Chamber Supply).
11. Partially open drain valve B. **Note:** It is normal for small amount of trapped air and/or water to discharge from the main drain when opened.
12. Slightly open the main water supply control valve until a small amount of water begins to flow through the main drain (valve B).
13. Once water begins to flow through the main drain Valve B slowly close Valve B until water begins to flow through Manual Emergency Release, Valve D.
14. Once a steady stream of water is flowing through the Valve D, (Manual Emergency Release) close Valve D.
15. Continue slowly closing the main drain, Valve B until it is fully closed.
16. If it is being used, reset the Model B1 Accelerator per the section in this bulletin titled "Resetting the Model B1 Accelerator". **Note:** The Model B1 Accelerator requires a minimum of 15 psi (1.0 bar) for proper operation.
17. Open Valve F. Observe if water leaks through the ball drip valve, valve G, into the drip cup, H. If no leak occurs, the Dry Pipe Valve's clapper is sealed.
18. Open slowly, and verify that the main valve controlling water supply is fully open and properly monitored.
19. Verify that valves A and F are open.

20. Secure the handle of the Model B Manual Emergency Release, valve D, in the closed position using a cable tie (provided with trim).

Draining Excess/Condensate Water form System

Refer to Figure 10

1. Close the main valve controlling water supply to Dry Pipe Valve. Also open main drain valve, valve B.
2. Open condensate drain valve E until all water has drained. Close valve E when the flow of water (if any) has stopped. **Note:** Be sure NOT to keep valve E open for an extended period of time because that will cause enough system air to bleed off thereby actuating the Model EX Dry Pipe Valve (see Table A for pneumatic pressure values required to maintain the Model EX Dry Pipe Valve closed for a given supply pressure). If the Model EX Valve does happen to actuate, proceed according to the directions listed in the "Resetting Model EX Dry Pipe Valve System" section of this bulletin.
3. If system contains pressurized air or nitrogen, allow pneumatic pressure to come back up to specification according to Table A. Slightly open the main valve controlling water supply to the Dry Pipe Valve. Slowly close the main drain valve, valve B until fully closed. Open fully the main valve controlling water supply.

Troubleshooting and Repair

1. Mechanical sprinkler alarm (water motor—not shown) not operating:

This is most likely caused by a clogged screen in the strainer of the water motor. Proceed as follows: Remove plug from the strainer. Remove and clean the screen. Replace the screen and the plug, and then tighten securely (Ref. Bulletin 613).

2. Leakage out of the ball drip valve G (Fig. 10).

a. Water leakage due to a water column above the Dry Pipe Valve's clapper:

This condition can be caused by leakage past the system side of the Model EX Dry Pipe Valve's seal assembly (#8, Fig. 9). Be sure that this surface is free of any type of debris. To eliminate leakage due to a water column, refer to the section in this bulletin marked "Draining Excess/Condensate Water From System". If the problem continues proceed to the following section.

b. Leakage, air or water from the ball drip valve, G (Fig. 10):

If system air is leaking out the ball drip valve, the problem is either damage to the air side of the Model EX Dry Pipe Valve's seal assembly (#8, Fig. 9), seat (#30, Fig. 9), the upper seat o-ring (#24, Fig. 9) or, on the 8" (200 mm) valve size only, the mounting ring o-ring (#2, Fig. 9). If supply water is leaking out the ball drip valve, the problem could be caused by damage to the Model EX Dry Pipe Valve's seal assembly (#8, Fig. 9), seat (#30, Fig. 9), or lower seat O-ring (#25, Fig. 9). The following section provides instructions to correct both conditions:

- A. Shut down the valve controlling the water supply to the Dry Pipe Valve and open the 1¼" main drain valve on the 2" (50mm), 2½" (65mm), 76mm and 3" (80mm) valve sizes or the 2" main drain valve on the 4" (100mm), 165mm, 6" (150mm) and 8" (200mm) valve sizes, valve B (Fig. 10). Open the water column drain valve E (Fig. 10). Open the Model B Manual Emergency Station, valve D (Fig. 10).
- B. Remove the Dry Pipe Valve's front (handhold) cover (#7, Fig. 9) and inspect the seat (#30, Fig. 9), clapper (#6, Fig. 9), and seal assembly (#8, Fig. 9) for damage. If inspection indicates damage to the seal assembly (#8, Fig. 9), replace as follows:
 Remove the bumpstop nuts (#10, Fig. 9) and remove the seal assembly (#8, Fig. 9). Install a new seal assembly (#8, Fig. 9) and thread the bumpstop nuts (#10, Fig. 9) onto the threaded studs of the seal assembly (#8, Fig. 9) and tighten finger tight plus ¼ to ½ turn. If inspection indicates damage to the clapper (#6, Fig. 9) only, then the clapper subassembly can be removed as follows:
 At the rear of the valve, disconnect the water column drain trim section by removing the ¾" x ½" reducing bushing (#38, Fig. 2).
 Remove the retaining ring (condensate drain side for the 2" (50mm), 2½" (65mm), 76mm, 3" (80mm) & 8" (200mm) valve sizes or hand hole side for the 4" (100mm), 6" (150mm) & 165mm valve sizes) from the clapper hinge pin (#19, Fig. 9) and push this pin through the hand hole opening for the 2" (50mm), 2½" (65mm), 76mm, 3" (80mm) & 8" (200mm) valve sizes or condensate drain port for the 4" (100mm), 6" (150mm) & 165mm valve sizes, and remove the clapper subassembly.
 Replace the seal assembly as described previously. Inspect the clapper (#6, Fig. 9) visually before reinstalling. Reinstall in the reverse order making sure the clapper spacers are in their proper position. If the seat (#30, Fig. 9) is damaged or it is suspected that the leakage is through the lower O-ring (#25, Fig. 9), the seat-clapper subassembly is easily removed as a unit as follows:
 Using Reliable P/N 6881603000 Seat Wrench for 2" (50mm), 2½" (65mm), 76mm and 3" (80mm) valve sizes, Reliable P/N 6881604000 Seat Wrench for 4" (100mm) valve size, Reliable P/N 6881606000 Seat Wrench for 6" (150mm) and 165mm valve sizes or Reliable P/N 6881608000 Seat Wrench for 8" (200mm) valve size, remove the seat by unscrewing. This will loosen the seat-clapper-mounting ring subassembly. Reach into the valve and grasp the seat and remove it from the valve. Then remove the clapper-mounting ring subassembly

from the valve. Visually examine all components of the seat-clapper-mounting ring subassembly replacing any component that appears damaged. New O-rings (#24 & #25, Fig. 9 and #2, Fig. 9 (for 8" valve size only)) should always be used for reassembly.

Reassembly:

Clean the bore of the valve body. Lubricate the bore with O-ring grease. Lubricate and install the O-rings (#24 & #25, Fig. 9) onto the seat. Lubricate and install the mounting ring o-ring (#2, Fig. 9) into the body (8" (200mm) valve size only). Insert the clapper-mounting ring subassembly into the hand hole opening of the Deluge Valve using caution to not damage or dislodge the mounting ring oring (#2, Fig. 9)(8" (200mm) valve size only). Align the mounting ring so that the Lever (#15, Fig. 9) is near the pushrod (#26, Fig. 9) and the mounting ring (#5, Fig. 9) "ears" are between the tabs of the valve body (#1, Fig. 9) for the 2" (50mm), 2½" (65mm), 3" (80mm) & 76mm valve sizes or the tab on the valve body (#1 Fig. 9) is between the "ears" of the mounting ring (#5, Fig. 9) for the 4" (100mm), 6" (150mm), 165mm & 8" (200mm) valve sizes. Insert the seat (#30, Fig. 9) into the valve body (#1, Fig. 9) and through the clapper-mounting ring subassembly. Start to tread the seat (#30, Fig. 9) into the body by hand, then tighten the seat (#30, Fig. 9) with Reliable P/N 6881603000 Seat Wrench for 2" (50mm), 2½" (65mm), 76mm and 3" (80mm) valve sizes, Reliable P/N 6881604000 Seat Wrench for the 4" valve size, Reliable P/N 6881606000 Seat Wrench for the 6" (150mm) & 165mm valve sizes or Reliable P/N 6881608000 Seat Wrench for 8" (200mm) valve size until it bottoms out on the mounting ring (#5, Fig. 9). Verify that the seat-clapper-mounting ring subassembly is in the fully down position between the tabs of the body for the 2" (50mm), 2½" (65mm), 3" (80mm) & 76mm valve sizes or the tab is between the "ears" of the mounting ring (#5, Fig. 9) for the 4" (100mm), 6" (150mm), 165mm & 8" (200mm) valve sizes, and check to see that the lever (#15, Fig. 9) lines up with the push rod (#26, Fig. 9). Loosen and reassemble if necessary. Reassemble the hand hole cover (#7, Fig. 9) and set up the Model EX Dry Pipe Valve as per the section "Resetting Model EX Dry Pipe Valve System" of this bulletin

Patents

U.S. Patent Number 7,673,695

Ordering Information

Specify:

- Valve Model, Size & End Connection –

Valve Part Numbers			
Valve Size & End Connection	Flange Type	Color	Reliable Part Number
2" (50mm) Grv/Grv	N/A	Black	6101021010
		Red	6101021015
2½" (65mm) Grv/Grv	N/A	Black	6101025010
		Red	61010251015
3" (80mm) Grv/Grv	N/A	Black	6101031010
		Red	6101031015
76mm Grv/Grv	N/A	Red	6101051015
4" (100mm) Grv/Grv	N/A	Black	6101041010
		Red	6101041015
4" (100mm) Flg/Grv	ASME Class 150	Black	6101041020
	ASME Class 150	Red	6101041025
	ISO PN16	Red	6101041045
4" (100mm) Flg/Flg	ASME Class 150	Black	6101041030
	ASME Class 150	Red	6101041035
	ISO PN16	Red	6101041055
6" (168mm) Grv/Grv	N/A	Black	6101061010
		Red	6101061015
6" (168mm) Flg/Grv	ASME Class 150	Black	6101061020
	ASME Class 150	Red	6101061025
	ISO PN16	Red	6101061045
6" (168mm) Flg/Flg	ASME Class 150	Black	6101061030
	ASME Class 150	Red	6101061035
	ISO PN16	Red	6101061055
165mm Grv/Grv	N/A	Red	6101065015
165mm Flg/Grv	ASME Class 150	Red	6101065025
	ISO PN16	Red	6101065045
8" (200mm) Grv/Grv	N/A	Black	6101081010
		Red	6101081015
8" (200mm) Flg/Flg	ASME Class 150	Black	6101081030
	ASME Class 150	Red	6101081035
	ISO PN16	Red	6101081055

- **Trim** – The trim set is available in individual parts, in time saving segmentally assembled kit forms, or in fully assembled to the Model EX Dry Pipe Valve (with or without a control valve)

TRIM PART NUMBERS:

2" (50MM), 2-1/2" (65MM), 3" (80MM) & 76MM:
 INDIVIDUAL TRIM COMPONENTS (ASSEMBLY REQUIRED, EX VALVE NOT INCLUDED):6501030001
 SEGMENTALLY ASSEMBLED TRIM (EX VALVE NOT INCLUDED):6501030002

4" (100MM), 6" (168MM), 165MM & 8" (200MM):
 INDIVIDUAL TRIM COMPONENTS (ASSEMBLY REQUIRED, EX VALVE NOT INCLUDED):6501060001
 SEGMENTALLY ASSEMBLED TRIM (EX VALVE NOT INCLUDED):6501060002

FOR FULLY ASSEMBLED TO MODEL EX VALVE SEE THE PART NUMBER SCHEME BELOW:

PART NUMBER SCHEME:

MISC OPTIONS:
 0: BLACK VALVE
 A: RED VALVE
 B: RED VALVE WITH DOMESTIC TRIM
 C: CHINESE MARKINGS ON VALVE
 D: BLACK VALVE WITH DOMESTIC TRIM

VALVE SIZE:
 1: 2" (50MM)
 2: 2-1/2" (65MM)
 3: 3" (80MM)
 4: 4" (100MM)
 5: 76MM
 6: 6" (168MM)
 7: 165MM
 8: 8" (200MM)

PRESSURE SWITCHES:
 1: POTTER WITH UL/ULC/FM APPROVALS
 2: SYSTEM SENSOR WITH ULC APPROVALS
 3: SYSTEM SENSOR WITH UL/FM APPROVALS

EXAMPLE P/N: 6506061010

CONTROL VALVE/ACCELERATOR:
 0: WITHOUT CONTROL VALVE, WITHOUT ACCELERATOR
 1: WITH CONTROL VALVE, WITHOUT ACCELERATOR
 2: WITHOUT CONTROL VALVE, WITH ACCELERATOR
 3: WITH CONTROL VALVE, WITH ACCELERATOR
 4: WITH CONTROL VALVE, WITH INLET SPOOL
 5: WITH CONTROL VALVE, WITH INLET SPOOL AND ACCELERATOR

NOTE: 76MM & 165MM NOT AVAILABLE WITH CONTROL VALVE.
4" (100MM), 6" (168MM) & 165MM WITH FLANGED INLET AND
FLANGED OUTLET OR FLANGED INLET AND FLANGED OUTLET
NOT AVAILABLE WITH CONTROL VALVE. 8" (200MM) WITH
FLANGED INLET AND FLANGED OUTLET NOT AVAILABLE WITH
CONTROL VALVE

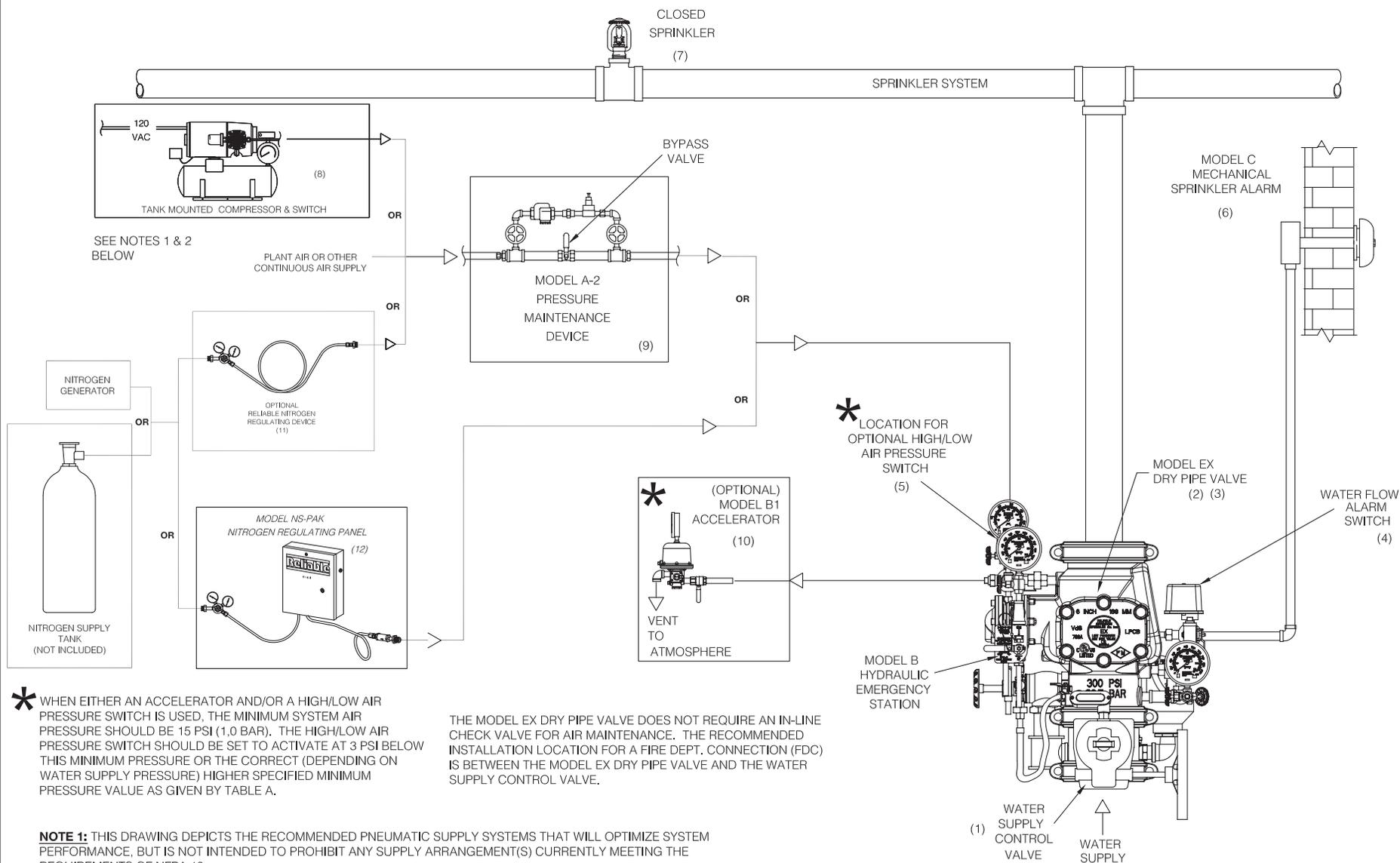
END CONNECTION:
 1: GROOVED INLET, GROOVED OUTLET
 2: CLASS 150 FLANGED INLET, GROOVED OUTLET
 3: CLASS 150 FLANGED INLET, CLASS 150 FLANGED OUTLET
 4: PN16 FLANGED INLET, GROOVED OUTLET
 5: PN16 FLANGED INLET, PN16 FLANGED OUTLET
NOTE: 2" (50MM), 2-1/2" (65MM), 3" (80MM) & 76MM NOT AVAILABLE
WITH FLANGED INLET AND FLANGED OUTLET OR FLANGED
INLET AND FLANGED OUTLET. 8" (200MM) NOT AVAILABLE
WITH FLANGED INLET AND GROOVED OUTLET.

THE EXAMPLE IS A BLACK 6" (168MM) VALVE WITH POTTER PRESSURE SWITCHES,
 WITHOUT A CONTROL VALVE, WITHOUT AN ACCELERATOR AND HAS A GROOVED INLET AND GROOVED OUTLET

359FG11B

Fig. 11

MODEL EX DRY PIPE VALVE SYSTEM COMPONENTS



24.

* WHEN EITHER AN ACCELERATOR AND/OR A HIGH/LOW AIR PRESSURE SWITCH IS USED, THE MINIMUM SYSTEM AIR PRESSURE SHOULD BE 15 PSI (1.0 BAR). THE HIGH/LOW AIR PRESSURE SWITCH SHOULD BE SET TO ACTIVATE AT 3 PSI BELOW THIS MINIMUM PRESSURE OR THE CORRECT (DEPENDING ON WATER SUPPLY PRESSURE) HIGHER SPECIFIED MINIMUM PRESSURE VALUE AS GIVEN BY TABLE A.

THE MODEL EX DRY PIPE VALVE DOES NOT REQUIRE AN IN-LINE CHECK VALVE FOR AIR MAINTENANCE. THE RECOMMENDED INSTALLATION LOCATION FOR A FIRE DEPT. CONNECTION (FDC) IS BETWEEN THE MODEL EX DRY PIPE VALVE AND THE WATER SUPPLY CONTROL VALVE.

NOTE 1: THIS DRAWING DEPICTS THE RECOMMENDED PNEUMATIC SUPPLY SYSTEMS THAT WILL OPTIMIZE SYSTEM PERFORMANCE, BUT IS NOT INTENDED TO PROHIBIT ANY SUPPLY ARRANGEMENT(S) CURRENTLY MEETING THE REQUIREMENTS OF NFPA 13.

NOTE 2: WHEN THE OPTIONAL MODEL B1 ACCELERATOR IS USED, A TANK MOUNTED COMPRESSOR OR NITROGEN TANK WITH THE MODEL A-2 PRESSURE MAINTENANCE DEVICE IS REQUIRED.

359FG12C

Fig. 12

• **Additional Equipment (refer to Fig. 12)**

Item No.	Component Part	Mfgr.	Description	Technical Bulletin
1	Water Supply Control Valve	Select	OS&Y	-
			Butterfly	-
	Tamper Switch (Optional) for OS&Y Valve	B	Model OS&Y2	Potter 5400928
			Tamper Switch (Optional) for Butterfly Valve	Model P1BV2
2	Dry Pipe Valve	A	Model EX 2" (50mm), 2½" (65mm), 3" (80mm), 76mm, 4" (100mm), 6" (150mm) 165mm or 8" (200mm)	Reliable 358/359
3	Dry Pipe Valve System	A	Refer to Parts in this Bulletin	Reliable 358/359
4	Waterflow Alarm Pressure Switch	B	Model PS10-2 (DPDT cULus, FM)	Potter 5400928
			Model PS10-2 (DPDT VdS)	
5	Low Air Alarm Pressure Switch	B	Model PS25-2 (DPDT cULus, FM)	Potter 5401564
			Model PS25-2 (DPDT VdS)	
6	Mechanical Alarm (Optional)	A	Model C	Reliable 612/613
7	Sprinklers	A	Closed Type	Reliable 110, 117, 131, 136, etc.
8	Air Compressor*	C	Per NFPA 13	Gast F-30
9	Pressure Maintenance Device	A	Model A-2 OR B-1	Reliable 254
10	Accelerator Kit*	A	Model B1	Reliable 323
11	Nitrogen Regulating Device	A	Regulator with Optional Low Air Pressure Switch	Reliable 254
12	Nitrogen Regulating Panel	A	Model NS-PAK	Reliable 254

* If the optional Model B1 Accelerator is used, a tank mounted air compressor and an A-2 pressure maintenance device must be provided. Additionally, the use of a tank mounted air compressor helps to eliminate on/off compressor cycling that may occur as a result of small leakage in the air line between the pressure maintenance device and the check valve, (item #15, Fig. 2) as well as due to ambient temperature changes in the system piping.

System Equipment Manufacturers

(A) Reliable Automatic Sprinkler Co. Inc

(B) Potter

(C) Gast Manufacturing Corp.

Nominal Pipe Size	Installation Dimensions in Inches (mm)																			
	A	B	C	D*	D**	D***	D****	D*****	E	F	G	H	I	J	K	L	M	N	P	Q
2" (50 mm)	8½ (216)	7 (178)	7½ (191)	12½ (318)	15¾ (400)	21¼ (540)	N/A	N/A	10¼ (260)	20¾ (527)	12½ (318)	4½ (114)	8¾ (222)	6¾ (171)	7¼ (184)	6¾ (171)	16 (406)	6 (152)	11 (279)	9¾ (248)
2½" (65 mm), 3" (80 mm) & 76 mm	8½ (216)	7 (178)	7½ (191)	12½ (318)	16½ (419)	22 (559)	N/A	N/A	10¼ (260)	20¾ (527)	12½ (318)	4½ (114)	8¾ (222)	6¾ (171)	7¼ (184)	6¾ (171)	16 (406)	6 (152)	11 (279)	9¾ (248)
4" (100 mm)	8½ (216)	7½ (191)	7½ (191)	14 (356)	18¾ (476)	24¼ (616)	16 (406)	16 (406)	11½ (292)	22 (559)	15¼ (387)	5½ (140)	9¾ (248)	7¾ (197)	8 (203)	10½ (267)	17½ (445)	6 (152)	11 (279)	11¾ (298)
6" (150 mm) & 165 mm	8½ (216)	8 (203)	7½ (191)	16 (406)	21¼ (540)	26¾ (679)	19 (483)	19 (483)	13¼ (337)	23¾ (603)	16 (406)	5½ (140)	10¼ (260)	8 (203)	10 (254)	11 (279)	19½ (495)	6 (152)	11 (279)	11¾ (298)
8" (200 mm)	8½ (216)	8½ (215)	7½ (191)	19¾ (492)	25¼ (641)	30¾ (781)	N/A	21¼ (540)	13½ (343)	24 (610)	16½ (419)	5½ (140)	12¼ (311)	9 (229)	7½ (191)	12¼ (311)	19¼ (489)	6 (152)	11 (279)	11¾ (298)

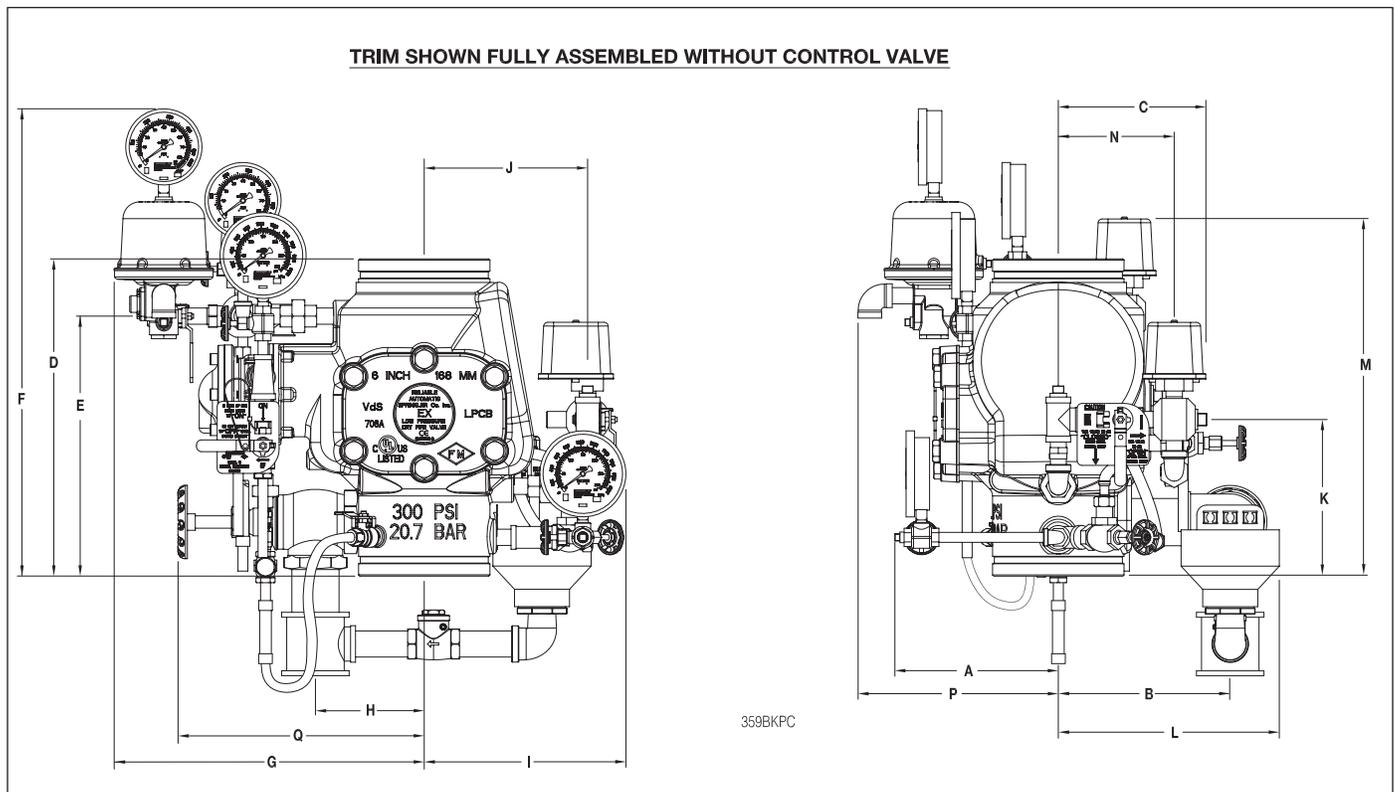
D* is the takeout for a Grv/Grv EX valve only.

D** is the total takeout for a Grv/Grv EX valve with a Reliable control valve or, for 2" (50 mm) valves only, Anvil control valve. Substituting a NIBCO control valve increases the total takeout to 22" (559 mm) for a 6" (150 mm) valve and reduces the total takeout to 24¾" (629 mm) for an 8" (200 mm) valve.

D*** is the total takeout for a Grv/Grv EX valve with an Inlet Spool and a Reliable control valve or, for 2" (50 mm) valves only, Anvil control valve. Substituting a NIBCO control valve increases the total takeout to 27½" (698 mm) for a 6" (150 mm) valve and reduces the total takeout to 30¼" (769 mm) for an 8" (200 mm) valve.

D**** is the takeout for a Flg/Grv EX valve only.

D***** is the takeout for a Flg/Flg EX valve only.



The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

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