



## TECHNICAL DATA

## ACCELERATOR MODEL D-2

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

### 1. DESCRIPTION

The Viking Model D-2 Accelerator is a quick-opening device, with an integral anti-flood assembly, used to increase the operating speed of a differential type dry pipe valve. An accelerator (quick-opening device) is recommended on all differential dry pipe valves and is required on dry pipe systems of certain capacities. Refer to NFPA Standards and Authorities Having Jurisdiction. The Viking Model D-2 Accelerator is a direct replacement for the Model D-1 Accelerator.

#### Features

- Pilot responsive
- Refer to NFPA-13 for maximum system size
- Automatically resets
- Integral anti-flood assembly
- Factory Tested



### 2. LISTINGS AND APPROVALS



**UL Listed:** VJPZ



**FM Approved:** ACCELERATORS with Built-In Anti-flooding Device.

### 3. TECHNICAL DATA

#### Specifications:

Shipping Weight: 6.2 lbs. (2.8 kg)

#### Material Specifications:

Refer Figure 2.

#### Ordering Information:

Available since 1998

Part Number: 09881

#### Accessories:

Model D-2 Accelerator Trim Kit (galvanized steel) for installation on Viking Model F Dry Valves (all sizes). Includes one air gauge. Viking Part No. 09730

### 4. INSTALLATION

#### A. On Dry Valve Trim

Verify that the water supply piping has been adequately flushed to reduce the opportunity for foreign matter to contaminate sprinkler piping and/or trim components. Install the Model D-2 Accelerator in the dry valve trim piping according to the Model D-2 Accelerator Trim Chart. The dry system air supply must be connected as shown on the trim chart. DO NOT expose the accelerator to the hydrostatic test.

#### **CAUTION**

**THE DRY VALVE CLAPPER MUST BE LATCHED OPEN DURING PERFORMANCE OF THE HYDROSTATIC TEST. FOLLOW INSTALLATION INSTRUCTIONS BELOW IN PARAGRAPH 4B: GENERAL INSTALLATION INSTRUCTIONS.**

#### B. General Installation Instructions

The air supply should be from an automatic, regulated and restricted source supplied with clean, dry, oil-free air (or nitrogen). Devices used should be specifically listed for such service. A Viking air maintenance device and an appropriately sized dehydrator are recommended. When corrosive atmospheres and/or contaminated water supplies are present, it is the owner's responsibility to verify compatibility with the Model D-2 Accelerator and associated equipment.

1. Remove all plastic thread protectors from the openings of the accelerator.
2. Apply a small amount of pipe-joint compound or tape to the external threads of all pipe connections required. Take care not to allow any compound, tape, or other foreign matter inside any of the nipples or openings of the accelerator or trim.
3. The Model D-2 Accelerator must be installed upright (with the air gauge opening at the top) as shown on the trim chart. Observe flow arrow, on bottom of accelerator, below the 1/2" NPT inlet.
4. Install a 0-80 psi (0-5.5 bar) retard to 250 psi (17.2 bar), air gauge in the 1/4" (8 mm) NPT opening in the top of the accelerator.
5. DO NOT expose the accelerator to the hydrostatic test.

Scan with smart phone to access technical and troubleshooting resources.



Viking Technical Data may be found on The Viking Corporation's Web site at <http://www.vikinggroupinc.com>. The Web site may include a more recent edition of this Technical Data Page.



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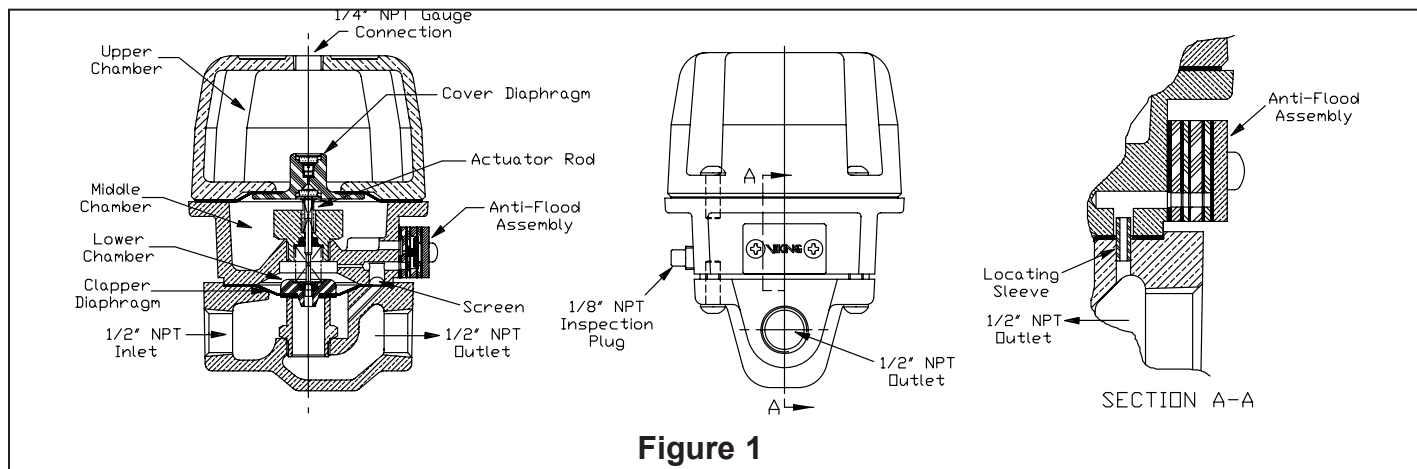


Figure 1

### ⚠ CAUTION

**THE ACCELERATOR ISOLATION VALVES ARE TO BE KEPT IN THE NORMALLY OPEN POSITION. DO NOT CLOSE, EXCEPT DURING HYDROSTATIC TESTING OR TO SERVICE THE ACCELERATOR.**

#### C. Placing In Service

##### I. On Dry Valve Trim

When the dry pipe system is ready to be placed in service, verify that all equipment is adequately heated and protected to prevent freezing and physical damage.

1. With the water supply main control valve CLOSED, drain all water from the dry pipe system. If the system has operated, open all low-point drains and the system flow test valve. Allow enough time to completely drain the system.
2. Verify that the intermediate chamber of the dry valve is free of water. No water should flow from the drip check when the plunger is pushed.
3. Reset the dry valve (Refer to individual Technical Data for the dry valve).
4. Close all low point drains, the system flow test valve, and the priming water level test valve in the dry valve trim.
5. Observe the air pressure gauge on top of the accelerator. The gauge must read zero before the accelerator will automatically reset. It may be necessary to loosen, remove, and re-install the accelerator air gauge (use the appropriate wrench) to vent trapped air pressure from the upper chamber, even when the gauge indicates zero if the air supply is on while performing this step.
6. Pressurize the system in accordance with recommended settings. DO NOT exceed 60 psi (4.1 bar).
7. When the air pressure on the accelerator air gauge equals the system set pressure, perform Dry Pipe Valve Priming Water Level Test described in Paragraph 6-B-1 to verify that water is not present above the priming level test valve in the dry valve trim. Priming water is NOT required for Viking dry valves. If the presence of water is detected above the priming level test valve, the system may not have been properly drained. To verify that the system has been properly drained, repeat Steps 1 through 7 above as required.

**NOTE: STEP 7 IS REQUIRED ANY TIME WATER HAS ENTERED THE SPRINKLER PIPING. IF NO WATER HAS BEEN ALLOWED TO ENTER THE SYSTEM SINCE THE PREVIOUS PRIMING WATER LEVEL TEST, THIS STEP MAY NOT BE REQUIRED.**

8. Open the main drain valve (located on the inlet of the dry valve).
9. Slowly open the water supply main control valve.
10. When flow is developed from the main drain, close the main drain valve.
11. Fully open and secure the water supply main control valve supplying the dry valve.
12. Secure all valves in their normal operating position.
13. Notify authorities having jurisdiction and those in the affected area that the system is in service.

#### 5. OPERATION (Refer to Figure 1.)

The accelerator operates on the principle of unbalanced pressures. When the accelerator is pressurized, air enters the inlet, goes



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through the screen filter into the lower chamber and through the anti-flood assembly into the middle chamber. From the middle chamber, the air slowly enters the upper chamber through an orifice restriction in the cover diaphragm.

In the SET position, the system air pressure is the same in all chambers. The accelerator outlet is at atmospheric pressure. When a sprinkler or release operates, the pressure in the middle and lower chambers will reduce at the same rate as the system. The orifice restriction in the cover diaphragm restricts the air flow from the upper chamber, causing a relatively higher pressure in the upper chamber. The pressure differential forces the cover diaphragm down, pushing the actuator rod down. This action vents the pressure from the lower chamber to the outlet, allowing the inlet pressure to force the clapper diaphragm open. The pressure in the accelerator outlet forces the anti-flood assembly closed.

On a dry pipe system the air pressure from the accelerator outlet is directed to the dry pipe valve intermediate chamber. As the air pressure increases in the intermediate chamber of the dry valve, the dry valve pressure differential is destroyed and the dry valve trips, allowing water to enter the dry pipe system.

After the dry valve trips, water entering the intermediate chamber of the dry valve will fill the trim piping connecting the accelerator to the dry system. However, when the anti-flood assembly is pressurized closed, water is prevented from entering the middle and upper chambers of the accelerator.

### NOTICE

**THE OWNER IS RESPONSIBLE FOR MAINTAINING THE FIRE PROTECTION SYSTEM AND DEVICES IN PROPER OPERATING CONDITION.**

## 6. INSPECTIONS, TESTS AND MAINTENANCE

### ⚠ WARNING

**ANY SYSTEM MAINTENANCE THAT INVOLVES PLACING A CONTROL VALVE OR DETECTION SYSTEM OUT OF SERVICE MAY ELIMINATE THE FIRE PROTECTION CAPABILITIES OF THAT SYSTEM. PRIOR TO PROCEEDING, NOTIFY ALL AUTHORITIES HAVING JURISDICTION. CONSIDERATION SHOULD BE GIVEN TO EMPLOYMENT OF A FIRE PATROL IN THE AFFECTED AREAS.**

Prior to performing any work on the system in which the Model D-2 Accelerator is installed, refer to technical data for the system and equipment used.

The Viking Model D-2 Accelerator must be kept free of foreign matter, freezing conditions, corrosive atmospheres, contaminated water supplies, and any condition that could impair its operation or damage the device.

It is imperative that the system be inspected and tested on a regular basis. The frequency of the inspections may vary due to contaminated water supplies, corrosive water supplies, corrosive atmospheres, as well as the condition of the air supply to the system. For minimum maintenance and inspection requirements, refer to NFPA 25. In addition, the authority having jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

#### A. Inspection

##### I. After every operation, and each time water is allowed to enter the system:

1. Inspect the interior of the accelerator for the presence of water. Dampness or condensation may indicate that the air supply is not being dried adequately. If water is allowed to enter the middle and/or upper chamber of the accelerator, it may contaminate the accelerator orifices and prevent it from operating properly.
2. Remove the 1/8" NPT inspection plug. If water or dampness is present, the accelerator must be disassembled (as described in Section 6-C-II: Disassembly), cleaned, and dried.

##### II. Inspection of Accelerators:

Weekly inspection is recommended. If the system is equipped with a low air (or nitrogen) alarm, monthly inspections may be adequate.

1. Check the air pressure gauge located on the top of the accelerator. Air pressure in the upper chamber of the accelerator should equal the air pressure maintained in the system on which it is installed. A difference in pressures other than slight variation due to gauge calibration tolerance may indicate gauge malfunction, plugged accelerator orifices and/or filters, or other maintenance is required. See Section 6-C ACCELERATOR MAINTENANCE.

**NOTE: STANDARD TOLERANCE ALLOWANCE IN PRESSURE GAUGE CALIBRATION MAY RESULT IN A SLIGHT VARIATION WHEN THE PRESSURE READINGS OF ANY TWO GAUGES ARE COMPARED.**

2. Verify that all other trim valves are in their normal operating position.
3. Check for signs of mechanical damage and/or corrosive activity. If detected, perform maintenance as required or, if necessary, replace the device.



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4. Verify that the accelerator and trim are adequately heated and protected to prevent freezing and physical damage.
5. Verify that the water supply main control valve is open and secure.

### B. Tests

#### I. Dry Pipe Valve Priming Water Level Test, Low Air Alarm Test, and Non-Flow Accelerator Test for Dry Valves Equipped with a Model D-2 Accelerator and Installed According to Model D-2 Accelerator Trim Charts:

The priming water level test is recommended quarterly and each time the system is placed in service after water has entered the system. Also, each time the system is placed in service after water has entered the system, it is good practice to repeat the priming water level test within one week. Testing is used to verify that the system has been properly drained and that no water is present above the priming level test valve in the dry valve trim after draining the system. Any water columning (accumulation of water above the priming level test valve) can slow or even prevent the dry valve clapper from opening when the dry system operates.

Quarterly testing of low air alarms is recommended. Semi-annual testing of accelerators is recommended. Conduct non-flow test when partial flow test or full flow test is not required:

1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. Close the water supply main control valve supplying the dry valve.
3. Open the main drain valve (located on the inlet of the dry valve).

**NOTE: PERFORMING STEPS 4 OR 5 OF THIS TEST WILL CAUSE THE ACCELERATOR TO OPERATE. HOWEVER, WITH THE WATER SUPPLY MAIN CONTROL VALVE CLOSED, AND THE MAIN DRAIN VALVE OPEN, OPERATION OF THE ACCELERATOR SHOULD NOT TRIP THE DRY VALVE.**

4. Dry valve priming water level test:
  - a. Verify that the water supply main control valve is closed and the main drain valve is open.
  - b. Close the air supply.
  - c. Fully open the priming level test valve in the dry valve trim to check for the presence of water. If the presence of water is detected, the system may not have been properly drained. Perform steps 1 through 7 in Paragraph 4-C-I of PLACING ACCELERATOR IN SERVICE on Dry Valve Trim.
  - d. When the test is complete: If/when no water is detected, open the air supply and continue to Step 6.
5. Low-air alarm test and non-flow accelerator test:
  - a. Verify that the water supply main control valve is closed and the main drain valve is open.
  - b. Gradually open the priming level test valve in the trim of the dry valve to simulate operation of the dry system. Observe and record the pressure at which the low air alarm operates.
  - c. When the test is complete, continue to Step 6.
6. Close the priming level test valve.
7. Loosen (use the appropriate wrench), and remove the accelerator air gauge to release pressure from the upper chamber of the accelerator, allowing it to reset.
8. Re-install and tighten (use the appropriate wrench) the accelerator air gauge.
9. Allow pressure to be restored to the dry pipe system and accelerator.
10. When air pressure on the accelerator air gauge equals the system set pressure, verify that the intermediate chamber of the dry valve is free of water. No water should flow from the drip check when the plunger is pushed.
11. When testing is complete, return the system being tested to service. Perform Steps 8 through 13 of Paragraph 4.C PLACING ACCELERATOR IN SERVICE on Dry Valve Trim.

### C. Accelerator Maintenance (Refer to Figure 2.)

#### I. On Dry Valves

To remove a Model D-2 Accelerator from the trim of the dry valve for inspection and/or maintenance:

1. Close the water supply main control valve and open the main drain (located on the inlet of the dry valve), placing the system out of service.
2. Isolate the accelerator from the system by closing the shut-off valves on the accelerator trim.
3. Loosen the accelerator air gauge to vent the trapped air pressure from the accelerator.
4. Loosen each of the pipe unions necessary to disconnect the accelerator from the trim.
5. Refer to Paragraph 6.II-B: Disassembly.

#### II. Disassembly (Refer to Figure 2.)

1. Remove the four cover screws (16a) from the base (15) using a 3/16" Allen wrench.
2. Remove the cover (1) from the housing (7).
3. Remove the cover diaphragm assembly (2) from the housing (7) for inspection. Blow air through filters and orifice. Replace the assembly if unit is damaged or plugged. **DO NOT attempt to wash or clean the filters or orifice. Water may cause them to become plugged, requiring replacement of the assembly.**
4. Remove the actuator rod (4), actuator rod spring (5), and retaining ring (3) for inspection and cleaning. Replace the actuator rod (4) if it is pitted, corroded, or damaged.

**NOTE: REPLACE BOTH U-CUPS (10) WHENEVER THE ACTUATOR ROD (4) IS REPLACED.**



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5. Remove the housing insert (6) using a socket wrench with a 1-3/8" socket.
6. With the housing insert (6) removed, the U-cup (10) and U-cup retainer (11) can be removed from the housing insert (6) using a tool with a diameter of 1/8" or less.
7. Remove the housing spring (12) from the housing (7).
8. To remove any other parts from the accelerator, the accelerator will now need to be turned over so that the base (15) is in the upright position.
9. Remove the four socket head screws (16b) from the base (15), using a 3/16" Allen wrench.
10. With the housing (7) now removed, the screen filter (9) can be removed using a tool with a diameter of 1/4" or less.
11. Remove the anti-flood kit from the housing (7) using a Phillips head screwdriver.
12. The clapper diaphragm (13) can now be removed from the base (15).
13. With the clapper diaphragm (13) now removed, the U-cup (10) and U-cup retainer (11) can be removed from the clapper diaphragm (13) using a tool with a diameter of 1/8" or less.
14. The seat (14) can now be removed from the base (15) using a socket wrench with a 7/8" socket.
15. If the locating pin (17) needs to be replaced (offered individually, not part of a repair kit), remove it from the base (15) and replace it with a new one.

### III. Installation of New Parts

To start installing the new parts, start from the base (15) and work your way up.

1. Install the seat (14) into the base (15) using a socket wrench with a 7/8" socket.
2. Before installing the clapper diaphragm (13), the U-cup (10) and U-cup retainer (11) must first be installed into the clapper diaphragm (13). To install the U-cup (10) and U-cup retainer (11) into the clapper diaphragm (13).
  - a. Apply the Lithium grease (18) evenly spread on the U-cup (10) and U-cup retainer (11).
  - b. Install the U-cup (10) and U-cup retainer (11) into the clapper diaphragm (13) with the tapered side of the U-cup (10) installed into the clapper diaphragm (13).
3. The clapper diaphragm (13) can now be installed onto the base (15) by lining up the hole in the clapper diaphragm (13) with the locating pin (17).
4. Install the new anti-flood kit onto the housing (7) with a Phillips head screwdriver, making sure the Viking logo is in the upright position.
5. Prior to installing the housing (7) back onto the base (15), the screen filter (9) will need to be installed into the housing (7), using a tool with a diameter of 1/4" or less.
6. Re-install the housing (7) onto the base (15) by lining up the hole in the housing (7), with the locating pin (17).
7. The accelerator can now be turned over so that the base (15) is in the upright position, and the four socket head screws (16b) can now be installed into the base (15) using a 3/16" Allen wrench.
8. Turning the accelerator over so that the housing (7) is now in the upright position, the housing spring (12) can now be installed into the housing (7).
9. Before installing U-cup (10) and U-cup retainer (11) into the housing insert (6):
  - a. Apply the Lithium grease (18) evenly spread on the U-cup (10) and U-cup retainer (11).
  - b. Install the U-cup (10) and U-cup retainer (11) into the housing insert (6) with the tapered side of the U-cup (10) installed into the housing insert (6).
10. Install the housing insert (6) into the housing (7), making sure that the center of the housing insert (6) lines up with the housing spring (12) and using a socket wrench with a 1-3/8" socket to install the housing insert (6).
11. Install the actuator rod spring (5) onto the actuator rod (4).
12. Install the actuator rod (4) into the housing insert (6).
13. Install the cover diaphragm assembly (2) onto the cover (1).

**NOTE: THE COVER DIAPHRAGM ASSEMBLY IS NOT PART OF THE REPAIR KIT. IT IS OFFERED AS AN INDIVIDUAL COMPONENT ONLY. SEE FIGURE 2.**

14. Install the cover (1) onto the housing (7) verifying that the center of the cover diaphragm assembly (2) lines up with the actuator rod (4).
15. The four cover screws (16a) can now be installed into the cover (1) using a 3/16" Allen wrench.

### 7. AVAILABILITY

The Viking Model D-2 Accelerator is available through a network of domestic and international distributors. See the Viking Corp. Web site for closest distributor or contact The Viking Corporation.

### 8. GUARANTEES

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.



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