

## SECTION 21 1316

### DRY PIPE SPRINKLER SYSTEMS MODEL F SERIES DRY VALVE

#### PART 1 GENERAL

##### 1.01 SECTION INCLUDES

- A. Dry-pipe sprinkler system.
- B. System design, installation, and certification.
- C. Fire department connections.

##### 1.02 RELATED REQUIREMENTS

- A. Section 28 3100 - Fire Detection and Alarm.
- B. Section 21 0500 - Common Work Results for Fire Suppression: Pipe, fittings, and valves.
- C. Section 21 0548 - Vibration and Seismic Controls for Fire Suppression Piping and Equipment.
- D. Section 21 0553 - Identification for Fire Suppression Piping and Equipment.
- E. Section 21 3000 - Fire Pumps.
- F. Section 21 1200 - Fire-Suppression Standpipes.

##### 1.03 REFERENCE STANDARDS

- A. FM P7825 - Approval Guide; Factory Mutual Research Corporation; current edition.
- B. NFPA 13 - Standard for the Installation of Sprinkler Systems; National Fire Protection Association; 2007
- C. NFPA 13R - Standard for the Installation of Sprinkler Systems in Residential Occupancies up to and Including Four Stories in Height; National Fire Protection Association; 2007
- D. UL (FPED) - Fire Protection Equipment Directory; Underwriters Laboratories Inc.; current edition.
- E. cUL (FPED) - Fire Protection Equipment Directory; Canadian Underwriters Laboratories, Inc.; current edition
- F. VdS Schadenverhütung - GDV - German Insurance Association, Germany
- G. CE - Construction Products Directive, Britain
- H. LPCB - Loss Prevention Council Bureau; BRE Certification Ltd., United Kingdom

- I. Additional Applicable Standards:
  - 1. \_\_\_\_\_
  - 2. \_\_\_\_\_
  - 3. \_\_\_\_\_
  - 4. \_\_\_\_\_

**1.04 ADMINISTRATIVE REQUIREMENTS**

- A. Pre-installation Meeting: Convene one week before starting work of this section.

**1.05 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.
- C. Shop Drawings:
  - 1. Submit preliminary layout of finished ceiling areas indicating only sprinkler locations coordinated with ceiling installation.
  - 2. Indicate hydraulic calculations, detailed pipe layout, hangers and supports, sprinklers, components and accessories. Indicate system controls.
  - 3. Submit shop drawings to authority having jurisdiction for approval. Submit proof of approval to Architect.
- D. Samples: Submit two of each style of sprinkler specified.
- E. Project Record Documents: Record actual locations of sprinklers and deviations of piping from drawings. Indicate drain and test locations.
- F. Manufacturer's Certificate: Certify that system has been tested and meets or exceeds specified requirements and code requirements.
- G. Operation and Maintenance Data: Include components of system, servicing requirements, record drawings, inspection data, replacement part numbers and availability, and location and numbers of service depot.  
<http://www.vikinggroupinc.com/manuals/Dry%20System%20Manual.pdf>
- H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
  - 1. See Section 01 6000 - Product Requirements, for additional provisions.
  - 2. Extra Sprinklers: Type and size matching those installed, in quantity required by referenced NFPA design and installation standard.
  - 3. Sprinkler Wrenches: For each sprinkler type.

**1.06 QUALITY ASSURANCE**

- A. Maintain one copy of referenced design and installation standard on site.

- B. Conform to FM requirements.
- C. Designer Qualifications: Design system under direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.
- D. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.
- E. Installers:
  - 1. \_\_\_\_\_.
  - 2. \_\_\_\_\_.
  - 3. \_\_\_\_\_.
- F. Installer Qualifications: Company specializing in performing the work of this section with minimum \_\_\_\_\_ years experience approved by manufacturer.
- G. Equipment and Components: Provide products that bear FM label or marking.
- H. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc., as suitable for the purpose specified and indicated.

### **1.07 MOCK-UP**

- A. Provide components for installation in mock-up.
- B. Mock-up may not remain as part of the Work.

### **1.08 DELIVERY, STORAGE, AND HANDLING**

- A. Store products in shipping containers and maintain in place until installation. Provide temporary inlet and outlet caps. Maintain caps in place until installation.

## **PART 2 PRODUCTS**

### **2.01 MANUFACTURERS**

- A. Sprinklers, Valves, and Equipment:
  - 1. Viking Corporation: [www.vikingcorp.com](http://www.vikingcorp.com)
  - 2. Substitutions: Not permitted.

### **2.02 SPRINKLER SYSTEM**

- A. Sprinkler System: Provide coverage for entire building.
- B. Occupancy: \_\_\_\_\_; comply with NFPA 13.

- C. Water Supply: Determine volume and pressure from water flow test data.
  - 1. If test data is not available assume \_\_\_\_ gpm (\_\_\_\_ L/s) at \_\_\_\_ psig (\_\_\_\_ kPa).
  - 2. Revise design when test data available prior to submittals.
- D. Interface system with \_\_\_\_\_.
- E. Provide fire department connections where indicated.
- F. Storage Cabinet for Spare Sprinklers and Tools: Steel, located adjacent to alarm valve.

### 2.03 SPRINKLERS

- A. Suspended Ceiling Type: Standard pendant or upright type with matching escutcheon or cover plate. <http://www.vikinggroupinc.com/databook/sprinkler%20selection.xls>
  - 1. Finish: Enamel, color \_\_\_\_\_.
  - 2. Escutcheon or Cover Plate Finish: Brass.
  - 3. Fusible Link: Glass bulb type temperature rated for specific area hazard.
  - 4. Substitutions: Not permitted
- B. Exposed Area Type: Standard upright type with guard. <http://www.vikinggroupinc.com/databook/sprinkler%20selection.xls>
  - 1. Finish: Brass.
  - 2. Fusible Link: Glass bulb type temperature rated for specific area hazard.
  - 3. Substitutions: Not permitted.
- C. Sidewall Type: Standard Horizontal Sidewall type with matching push on escutcheon plate. <http://www.vikinggroupinc.com/databook/sprinkler%20selection.xls>
  - 1. Finish: Brass.
  - 2. Escutcheon Finish: Brass.
  - 3. Fusible Link: Fusible solder link type temperature rated for specific area hazard.
  - 4. Substitutions: Not permitted.
- D. Dry Sprinklers: Standard Pendant, Upright or Sidewall type with matching escutcheon plate or as plain barrel. <http://www.vikinggroupinc.com/databook/sprinkler%20selection.xls>
  - 1. Finish: Brass.
  - 2. Escutcheon or Cover Plate Finish: Brass.
  - 3. Fusible Link: Fusible solder link type temperature rated for specific area hazard.
  - 4. Substitutions: Not permitted
- E. Storage Sprinklers: Standard upright or pendent with guard or without guard, with shield or without shield. <http://www.vikinggroupinc.com/databook/sprinkler%20selection.xls>
  - 1. Finish: Brass, Chrome, Enamel,
  - 2. Shield & Guard: Brass, Chrome
  - 3. Fusible Link: Fusible solder link type, or glass bulb type rated for specific area hazard
  - 4. Substitutions: Not permitted.
- F. Guards: Chrome finish. <http://www.vikinggroupinc.com/databook/sprinklers/guards/012798.pdf>

## 2.05 SYSTEM VALVES AND DEVICES

- A. Dry Pipe Sprinkler Valve:  
The dry pipe valve shall be a positive latching clapper, differential type dry valve. Dry valve shall be UL Listed and Factory Mutual Approved. Air pressure to water pressure area differential to be approximately 6 to 1. Dry pipe valve trim shall be galvanized. Dry Pipe Valve manufacturer to be The Viking Corporation. The Dry Pipe Valve to be Viking Model F-1 or F-2. Model F-1 - <http://www.vikinggroupinc.com/databook/drysystems/equipment/070392.pdf>  
Model F-2 - <http://www.vikinggroupinc.com/databook/drysystems/equipment/011507.pdf>
- B. Air Maintenance Device:  
Air supplies provided for sprinkler systems shall be equipped with an automatic air pressure maintenance device. Air maintenance device shall be equipped with a ¼" air supply bypass with a field adjustable air pressure regulator with a built-in ball check valve to eliminate air loss when system is in service. Air maintenance device shall have a factory setting of 40 PSI. Air Maintenance Device manufacturer to be The Viking Corporation. Air Maintenance Device to be Viking Model D-2. <http://www.vikinggroupinc.com/databook/drysystems/equipment/041989.pdf>
- C. Quick Opening Device:  
If water cannot be delivered to the dry system inspectors test connection within a minute of opening, a quick opening device shall be provided on the system riser. The quick opening device shall be of the same manufacturer as the dry pipe valve. The sprinkler system quick opening device shall be an accelerator with an external anti-flooding device. Accelerator manufacturer to be The Viking Corporation. Accelerator to be Viking Model E-1. <http://www.vikinggroupinc.com/databook/drysystems/equipment/071692.pdf>
- D. Anti-Flooding Device:  
Accelerators installed on sprinkler systems shall be equipped with an external anti-flooding device. Anti-flooding device shall be of a brass body. Anti-flooding device shall be UL Listed and Factory Mutual Approved. Anti-Flooding Device manufacturer to be The Viking Corporation. Anti-Flooding Device to be Viking Model B-1. <http://www.vikinggroupinc.com/databook/drysystems/equipment/120292.pdf>
- E. Quick Opening Device (Optional):  
Where required, the sprinkler system quick opening device shall be a UL Listed and Factory Mutual Approved accelerator with an internal anti-flooding device. Accelerator shall have an air source from a dependable air source regulated through an approved air maintenance device. Accelerator shall be of the same manufacturer as the dry pipe valve or deluge valve and be listed for use together. Accelerator manufacturer to be The Viking Corporation. Accelerator to be Viking Model D-2. <http://www.vikinggroupinc.com/databook/drysystems/equipment/010898.pdf>
- F. Pressure Supervisory Switch:  
Low air pressure alarm will activate by way of a pressure supervisory alarm pressure switch. The low air pressure alarm switch shall be compatible with system devices. Low air pressure alarm switch enclosure shall be UL Listed and Factory Mutual Approved for the application in which it is used. Low air pressure alarm switch shall have the ability to be wired for Class A or Class B service. Low Air Pressure Alarm Switch shall be Potter, Model Number PS401A or PS402A. <http://www.vikinggroupinc.com/usrelated/potter/ps40a.pdf>
- G. Alarm Pressure Switch:  
Water flow will activate an alarm by way of an alarm pressure switch. The alarm pressure switch shall be compatible with system devices. Alarm pressure enclosure shall be UL Listed and Factory Mutual Approved. Alarm pressure switch shall have the ability to be wired for

Class A or Class B service. Alarm Pressure Switch shall be Potter, model number PS101A or PS102A. <http://www.vikinggroupinc.com/usrelated/potter/ps10a.pdf>

H. Water Motor Alarm

Water flow will activate a hydraulic powered water motor alarm by way of integral valve alarm line trim piping. Water motor gong shall be connected to a water pressure retarding chamber to limit the propensity of unnecessary alarms. Water motor alarm shall be equipped with a rear closure plate to limit the access of foreign materials or accumulation of debris. Water motor alarm shall be UL Listed and Factory Mutual Approved for the application in which it is used. Water Motor Alarm manufacturer to be The Viking Corporation. Water Motor Alarm Model to be Viking Model F-2. <http://www.vikinggroupinc.com/databook/alarmdevices/082789.pdf>

I. Model LD-1 Anti-Column Device

The anti-column device shall have a stainless steel body and shall utilize a stainless steel float ball which rises when water in the system accumulates to the level of the anti-column device. When the float ball rises, water is automatically drained from the system. The anti-column device shall be UL listed and FM approved. The anti-column device shall be manufactured by the Viking Corporation. Anti-column Device Model to be Viking LD-1. <http://www.vikinggroupinc.com/databook/drysystems/equipment/091707.pdf>

J. Dehydrator

When air supplies for dry pipe or preaction sprinkler systems are subject to moisture or condensation into the system piping, an air dehydrator shall be installed in the air supply piping to the system. The air dehydrator shall be equipped with a means of visually indicating if the medium used to remove moisture is saturated. Air dehydrator shall have a drying capacity of 4400 sc ft of air at -45°F and be capable of maximum air flow of 10 sc ft/min at 100 PSI. Air Dehydrator manufacturer shall be The Viking Corporation, part number 01285A. <http://www.vikinggroupinc.com/databook/drysystems/equipment/042089.pdf>

K. System Control Valve:

The dry system control valve shall be a listed indicating type valve. The control valve shall be UL Listed and Factory Mutual Approved for fire protection installations. The system control valve shall be rated for normal working pressure but in no case less than 175 PSI.

L. Fire Department Connections:

1. Type: Flush mounted wall type with brass finish.
2. Outlets: Two-way with thread size to suit fire department hardware; threaded dust cap and chain of matching material and finish.
3. Drain: 3/4 inch (19 mm) automatic drip, outside.
4. Label: "Sprinkler - Fire Department Connection".

M. Tank Temperature Supervisory Switches: As manufactured by \_\_\_\_\_ Model \_\_\_\_\_.

N. Room Temperature Supervisory Switches: As manufactured by \_\_\_\_\_ Model \_\_\_\_\_.

## 2.06 AIR COMPRESSOR

A. Manufacturers:

1. Viking Corporation; Product Model F-1. <http://www.vikinggroupinc.com/databook/drysystems/equipment/032101.pdf>
2. Substitutions: See Section 01 6000 - Product Requirements.

- B. Compressor: Single unit, electric motor driven, motor, motor starter, safety valves, check valves, air maintenance device incorporating electric pressure switch and unloader valve.
- C. Electrical Characteristics:
  - 1. The automatic sprinkler piping is supervised by compressed air from a source installed inside.
  - 2. The air supply must be regulated and of the proper size in order to be able to restore normal system air pressure within 30 minutes.
    - a. \_\_\_\_\_ hp.
    - b. \_\_\_\_\_ volts,
    - c. \_\_\_\_\_ phase
    - d. \_\_\_\_\_ Hz

## **PART 3 EXECUTION**

### **3.01 INSTALLATION**

- A. Install in accordance with referenced NFPA design and installation standard.
- B. Install equipment in accordance with manufacturer's instructions.
- C. Install buried shut-off valves in valve box. Provide post indicator.
- D. Provide approved double check valve assembly at sprinkler system water source connection.
- E. Locate fire department connection with sufficient clearance from walls, obstructions, or adjacent siamese connectors to allow full swing of fire department wrench handle.
- F. Locate outside alarm gong on building wall as indicated.
- G. Place pipe runs to minimize obstruction to other work.
- H. Place piping in concealed spaces above finished ceilings.
- I. Center sprinklers in two directions in ceiling tile and provide piping offsets as required.
- J. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.
- K. Install and connect to fire pump system in accordance with Section 21 3000.
- L. Install air compressor on vibration isolators. Refer to Section 22 0548.
- M. Install air compressor on vibration isolators. Refer to Section 21 0548.
- N. Flush entire piping system of foreign matter.
- O. Install guards on sprinklers where indicated.
- P. Hydrostatically test entire system.

Q. Require test be witnessed by Fire Marshal.

### **3.02 INTERFACE WITH OTHER PRODUCTS**

A. Ensure required devices are installed and connected as required to fire alarm system.

### **3.03 SCHEDULES**

A. System Hazard Areas:

1. Offices: Light Hazard.
2. Warehouse: Ordinary Hazard, Group 2.
3. Computer Room: Light Hazard, Pre-action.

B. Sprinklers:

1. Drawing Code:
2. Manufacturer:
3. Model:
4. Location:
5. Temperature Rating:
6. Finish:
7. Style:

**END OF SECTION**