VIKING®

TECHNICAL DATA

DELUGE SYSTEM CONTROLLED BY ELECTRIC RELEASE

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-945-4495 Email: techsvcs@vikingcorp.com

1. DESCRIPTION

(Refer to Figures 1-4)

Viking Deluge Systems utilize a Viking Deluge Valve to control the water supply to system piping equipped with open sprinklers and/or spray nozzles. The system piping remains empty until the deluge valve is activated by operation of the release system. Deluge systems are commonly used where it is desirable to simultaneously spray water from all open sprinklers and/or nozzles on the system when it operates. Electrically controlled deluge systems require an electric solenoid valve controlled by an approved system control Panel with compatible detection system.

In fire conditions, when the detection system operates, the system control panel energizes solenoid valve open, causing the deluge valve to open and allowing water to enter the system piping. Water will flow from any open sprinklers and/or spray nozzles on the system.

2. LISTINGS AND APPROVALS

FM Approved - The Viking electrically controlled Deluge System is FM Approved when installed with specific components. Refer to current FM Approval Guide. Consult the manufacturer for any component approvals too recent to appear in the FM Approval Guide.

3. SYSTEM OPERATION

(Refer to Figures 1-4)

A. IN THE SET CONDITION

System water supply pressure enters the priming chamber of the deluge valve through the 1/4" (6,4 mm) priming line, which includes a normally open priming valve (B.1), strainer (B.2), restricted orifice (B.3) and Check Valve (B.4) and the normally closed PORV (B.10). In the SET condition, water supply pressure is trapped in the Priming Chamber by Check Valve (B.4) and normally closed Solenoid Valve (E.1). The pressure in the Priming Chamber holds the Deluge Valve clapper closed, keeping the outlet chamber and system piping dry.

B. IN FIRE CONDITIONS

When the detection system (E.4) operates, the System Control Panel (E.3) activates an alarm and energizes the normally closed Solenoid Valve (E.1) open. Pressure is released from the priming chamber faster than it is supplied through restricted orifice (B.3) (B.3). The Deluge Valve clapper opens to allow water to flow into the system piping and alarm devices, causing the water motor alarm (C.2) and water flow alarms connected to the alarm pressure switch (C.1) to activate. Water will flow from any open sprinklers and/or spray nozzles on the system.

C. FOR DELUGE VALVE TRIM

(Refer to Figures 1-4)

When the Deluge Valve operates, the air side of the PORV (B.10) loses pressure, causing the PORV (B.10) to operate. When the PORV (B.10) operates, it continually vents the priming chamber to prevent the Deluge Valve (A.1) from resetting even if the open releasing devices close. The Deluge Valve (A.1) can only be reset after the system is taken out of service, and the outlet chamber of the deluge valve and associated trim piping are de-pressurized and drained.

D. TROUBLE CONDITIONS

If the detection system operates due to mechanical damage or malfunction, the Deluge Valve will open. Water will flow from any open sprinklers and/or spray nozzles on the system. Water motor alarm (C.2) and alarms connected to alarm pressure switch (C.1) will activate.

E. MANUAL OPERATION

Anytime the handle inside emergency release (B.11) is pulled, pressure is released from the priming chamber and the deluge valve (A.1) will open. Water will flow into the system piping and alarm devices. Water will flow from any open sprinklers and/or spray nozzles on the system.

4. INSTALLATION

Refer to current Viking Technical Data describing individual components of the Viking Deluge System. Technical Data describing the Viking Deluge Valve and other system components are packed with product and in the *Viking Engineering and Design Data* book.

Also, refer to applicable installation standards, codes, and Authorities Having Jurisdiction.

1. The deluge valve (A.1) and trim must be installed only in areas where they will not be subjected to freezing temperatures.
2. Alarm pressure switch (C.1) should activate when pressurized to 4 to 8 PSI (.3 to .6 bar) on pressure rise. Alarm pressure switch (C.1) should be wired to activate the waterflow alarm.
3. All initiating devices (detectors) (E.4), indicating appliances, releasing devices(E.1), and the system control panel (E.3) must be compatible and approved for use with the deluge system that is used. Refer to appropriate Fire Protection Equipment Approval Guides and current Viking Technical Data describing individual components of the Viking Deluge System that is used.

Revised page replaces page 204a-h dated May 7, 2007.
(Updated drawings with new PORV.)

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5. PLACING THE SYSTEM IN SERVICE

(Refer to Figures 1-4)

NOTE: FOR NEW INSTALLATIONS, REFER TO INSTRUCTIONS PROVIDED IN TECHNICAL DATA DESCRIBING THE VIKING DELUGE VALVE AND OTHER SYSTEM COMPONENTS. (SEE SECTION 8.)

To Return a System to Service:

1. Verify that the system has been properly drained. Auxiliary drain (B.6) should be open. Verify that the emergency release (B.11) is closed.
2. Open the priming valve (B.1).
3. Reset the system control panel. For Viking Model VFR400 Panel, open the panel and press “RESET”. Solenoid valve (E.1) should close. Flow from the solenoid valve (E.1) to the drain cup should stop.
4. Open the flow test valve (B.15).
5. Partially open the main water supply control valve (D.1).
6. When full flow develops from the flow test valve (B.15), close the flow test valve (B.15). Verify that there is no flow from the open auxiliary drain (B.6).
7. Close the auxiliary drain (B.6).
8. Fully open and secure the main water supply control valve (D.1).
9. Verify that the alarm shut-off valve (B.9) is open and that all other valves are in their normal operating position.
10. Depress the plunger of the drip check valve (B.7). No water should flow from the drip check valve (B.7) when the plunger is pushed

6. EMERGENCY INSTRUCTIONS

(Refer to Figures 1-4)

To Take System Out of Service:

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

After a fire, verify that the fire is OUT and that placing the system out of service has been authorized by the appropriate Authority Having Jurisdiction.

1. Close the water supply control valve (D.1).
2. Open the auxiliary drain (B.6).
3. Silence alarms (optional).
   a. To silence electric alarms controlled by Viking Model VFR400 Release Control Panel, open panel, and press “ALARM SILENCE”.
   b. To silence electric alarms controlled by the pressure switch (C.1) and to silence the water motor alarm (C.2), close the alarm shut-off valve (B.9).

NOTE: ELECTRIC ALARMS CONTROLLED BY A PRESSURE SWITCH INSTALLED IN THE ½” (15 MM) NPT CONNECTION FOR A NON-INTERRUPTIBLE ALARM PRESSURE SWITCH CANNOT BE SHUT OFF UNTIL THE DELUGE VALVE IS RESET OR TAKEN OUT OF SERVICE.

NOTE: SPRINKLER SYSTEMS THAT HAVE BEEN SUBJECTED TO A FIRE MUST BE RETURNED TO SERVICE AS SOON AS POSSIBLE. THE ENTIRE SYSTEM MUST BE INSPECTED FOR DAMAGE, AND REPAIRED OR REPLACED AS NECESSARY.

4. Close the priming valve (B.1) (optional). Sprinkler systems that have been subjected to a fire must be returned to service as soon as possible. The entire system must be inspected for damage, and repaired or replaced as necessary.
5. Replace any detectors (E.4) that have been damaged.
6. Replace any sprinklers and/or spray nozzles that have been damaged or have been exposed to fire conditions.
7. Perform all maintenance procedures recommended in Technical Data describing individual components of the system that has operated.
8. Return the system to service as soon as possible. Refer to section 5. PLACING THE SYSTEM IN SERVICE.

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7. INSPECTIONS AND TESTS

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

It is imperative that the system be inspected and tested on a regular basis in accordance with NFPA 25. Refer to INSPECTIONS and TESTS recommended in current Viking Technical Data describing individual components of the Viking Deluge System used. (See section 8 for hyperlinks to Viking Technical Data.)

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.

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.

8. ORDERING INSTRUCTIONS

To order a complete Electric release Deluge system, the following components must be purchased: Deluge Valve, Conventional Trim, and a Release Trim package.

Valve Part Numbers

DESCRIPTION	NOMINAL SIZE	PART NUMBER
DELUGE VALVE		
Angle Style		
Threaded NPT Painted Red		
Model & Pipe O.D.		
Model E-3 48mm	1½" / DN40	09889
Model E-1 60mm	2" / DN50	05852C
HALAR®		
Model E-4 48mm	1½" / DN40	09890Q/B
Model E-2 60mm	2" / DN50	08361Q/B
Flange/Flange Painted Red		
Flange Drilling	**Model E-1**	
ANSI	3"	05912C
ANSI	4"	05909C
ANSI	6"	05906C
ANSI/Japan	6"	07136
PN10/16	DN80	08626
PN10/16	DN100	08629
PN10/16	DN150	08631
HALAR®		
Flange Drilling	**Model E-2**	
ANSI	3"	08362Q/B
ANSI	4"	08363Q/B
ANSI	6"	08364Q/B
PN10/16	DN80	08862Q/B
PN10/16	DN100	08863Q/B
PN10/16	DN150	08864Q/B
Flange/Groove Painted Red		
Flange Drilling / Pipe O.D.	**Model E-1**	
ANSI / 89mm	3"	05835C
ANSI / 114mm	4"	05839C
ANSI / 168mm	6"	05456C
PN10/16 / 89mm	DN80	09539
PN10/16 / 114mm	DN100	09540
PN10/16 / 168mm	DN150	05456C
HALAR®		
Flange Drilling / Pipe O.D.	**Model E-2**	
ANSI / 89mm	3"	11064Q/B
ANSI / 114mm	4"	11065Q/B
ANSI / 168mm	6"	11001Q/B
PN10/16 / 168mm	DN150	11001Q/B

DESCRIPTION	NOMINAL SIZE	PART NUMBER
Straight Through		
Threaded Painted Red		
Pipe O.D.	**Model F-1**	
NPT 48mm	1½"	12126
NPT 60mm	2"	12059
NPT 65mm	2½"	12401
BSP 48mm	DN40	12682
BSP 60mm	DN50	12686
HALAR®	**Model F-2**	
NPT 65mm	2½"	12402Q/B
Flange/Flange Painted Red		
Flange Drilling	**Model F-1**	
ANSI	3"	12014
ANSI	4"	11953
ANSI	6"	11955
ANSI	8"	11991
ANSI/Japan	6"	11964
PN10/16	DN80	12026
PN10/16	DN100	11965
PN10/16	DN150	11956
PN10	DN200	11995
PN16	DN200	11999
HALAR®		
Flange Drilling	**Model F-2**	
ANSI	3"	12015Q/B
ANSI	4"	11960Q/B
ANSI	6"	11962Q/B
ANSI	8"	11992Q/B
PN10/16	DN80	12027Q/B
PN10/16	DN100	11966Q/B
PN10/16	DN150	11963Q/B
PN10	DN200	11996Q/B
PN16	DN200	12000Q/B

Note: When viewing this datapage online, Part Numbers displayed in BLUE are hyperlinks. Clicking the part number will open the corresponding Technical Data Page.

DESCRIPTION	NOMINAL SIZE	PART NUMBER
Flange/Groove Painted Red		
Flange Drilling / Pipe O.D.	Model F-1	
ANSI / 89mm	3"	12018
ANSI / 114mm	4"	11952
ANSI / 168mm	6"	11954
PN10/16 / 89mm	DN80	12030
PN10/16 / 114mm	DN100	11958
PN10/16 / 165mm	DN150	12640
PN10/16 / 168mm	DN150	11954
HALAR®		
Flange Drilling / Pipe O.D.	**Model F-2**	
ANSI / 89mm	3"	12019Q/B
ANSI / 114mm	4"	11959Q/B
ANSI / 168mm	6"	11961Q/B
PN10/16 / 89mm	DN80	12644Q/B
PN10/16 / 114mm	DN100	12645Q/B
PN10/16 / 165mm	DN150	12641Q/B
PN10/16 / 168mm	DN150	11961Q/B
Groove/Groove Painted Red		
Pipe O.D.	**Model F-1**	
48mm	1½" / DN40	12125
60mm	2" / DN50	12057
73mm	2½" / DN65	12403
76mm	DN80	12729
89mm	3" / DN80	12022
114mm	4" / DN100	11513
165mm	DN150	11910
168mm	6" / DN150	11524
219mm	8" / DN200	11018
HALAR®		
Pipe O.D.	**Model F-2**	
48mm	1½" / DN40	12127Q/B
60mm	2" / DN50	12058Q/B
73mm	2½" / DN65	12404Q/B
76mm	DN80	12730Q/B
89mm	3" / DN80	12023Q/B
114mm	4" / DN100	11514Q/B
165mm	DN150	11911Q/B
168mm	6" / DN150	11525Q/B
219mm	8" / DN200	11118Q/B

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Valve Trim Package Part Numbers

DESCRIPTION	NOMINAL SIZE	PART NUMBER
CONVENTIONAL DELUGE VALVE TRIM	Rated to 250 psi (1 724 kPa)	
Includes Deluge Valve Accessory Package	Use with Angle Style Valves	
	Galvanized	
	1½" / DN40	14629-1
	2" / DN50	14630-1
	3" / DN80	14631-1
	4" / DN100	14632-1
	6" / DN150	14633-1
	Brass	
	1½" / DN40	14629-2
	2" / DN50	14630-2
	3" / DN80	14631-2
	4" / DN100	14632-2
	6" / DN150	14633-2
	Use with Straight Through Valves	
	Galvanized	
Hoz.	1½" / DN40	14635-1
	2" / DN50	14635-1
	2½" / DN65	14637-1
	3" / DN80	14637-1
	4" / DN100	14638-1
	6" / DN150	14640-1
	8" / DN200	14643-1
Vert.	1½" / DN40	14634-1
	2" / DN50	14634-1
	2½" / DN65	14636-1
	3" / DN80	14636-1
	4" / DN100	14639-1
	6" / DN150	14641-1
	8" / DN200	14642-1
	Brass	
Hoz.	1½" / DN40	14635-2
	2" / DN50	14635-2
	2½" / DN65	14637-2
	3" / DN80	14637-2
	4" / DN100	14638-2
	6" / DN150	14640-2
	8" / DN200	14643-2
Vert.	1½" / DN40	14634-2
	2" / DN50	14634-2
	2½" / DN65	14636-2
	3" / DN80	14636-2
	4" / DN100	14639-2
	6" / DN150	14641-2
	8" / DN200	14642-2

Release Trim Package Part Numbers

ELECTRIC RELEASE TRIM PACKAGES	
Finish	**Part Number**
Use with Straight Through and Angle Style Valves	
Galvanized	10830
Brass	10832
NOTE: Solenoid valve must be ordered separately.	

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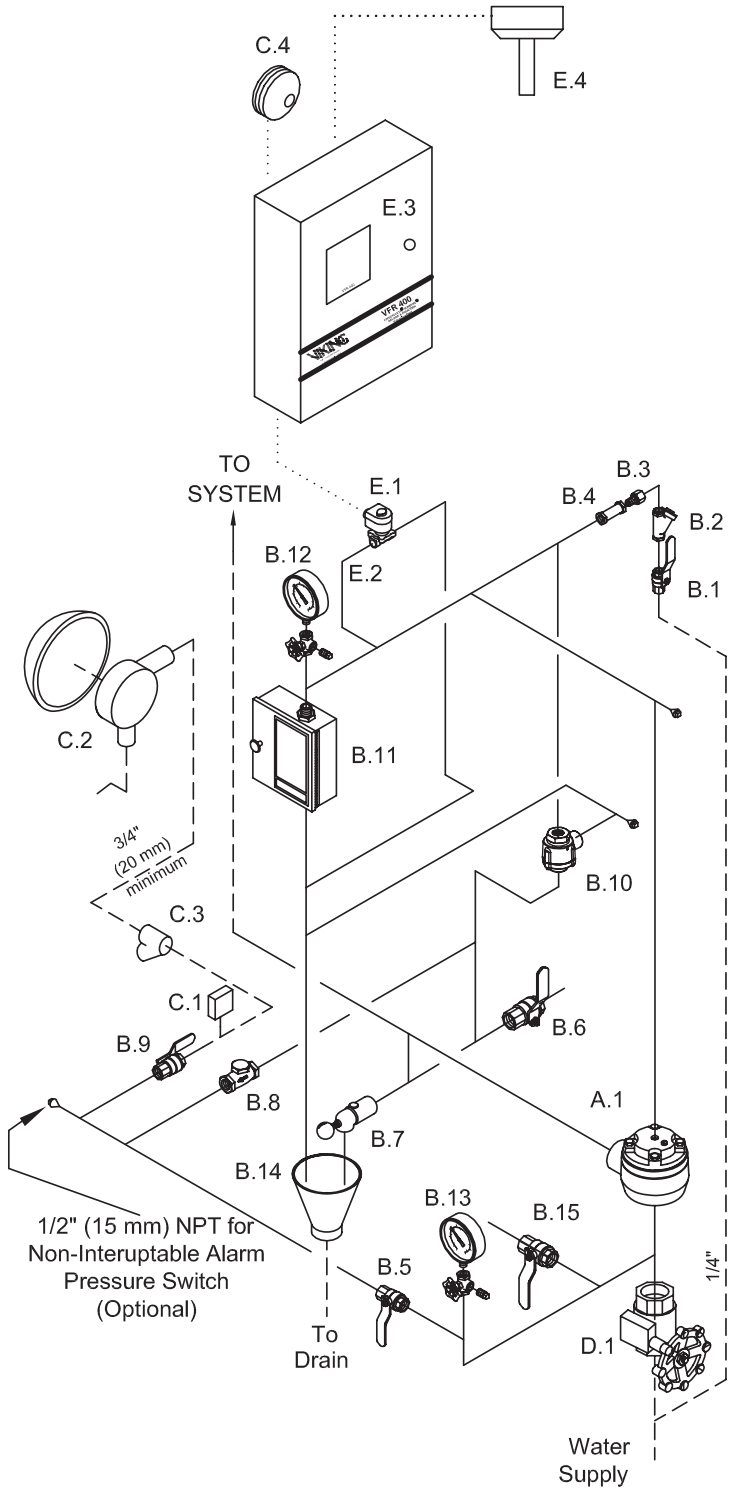

SYSTEM COMPONENTS

A. Valve
- A.1 Deluge Valve

B. Deluge Valve Conventional Trim *
(See Deluge Valve Conventional Trim Charts)
- B.1 Priming Valve
- B.2 Strainer
- B.3 1/16" Restricted Orifice
- B.4 Spring Loaded Check Valve
- B.5 Alarm Test Valve (Normally Closed)
- B.6 Auxiliary Drain Valve (Normally Closed)
- B.7 Drip Check Valve
- B.8 Drain Check Valve
- B.9 Alarm Shut-Off Valve (Normally Open)
- B.10 Pressure Operated Relief Valve (P.O.R.V.)
- B.11 Emergency Release
- B.12 Priming Pressure Water Gauge and Valve
- B.13 Water Supply Pressure Gauge and Valve
- B.14 Drain Cup
- B.15 Flow Test Valve (Normally Closed)

C. Water Flow Alarm Equipment
- C.1 Alarm Pressure Switch and/or
- C.2 Water Motor Alarm (Strainer Required)
- C.3 Strainer
- C.4 Electric Alarm Bell

D. Riser
- D.1 Water Supply Control Valve

E. Release System
- E.1 Solenoid Valve
- E.2 Electric Release Module Trim
- E.3 System Control Panel configured for Single Zone Deluge operation.
- E.4 Electric Detection System. Heat Detector shown for clarity.

— — — Dashed lines indicate pipe required but not listed in "System Components" Table.

* Viking Deluge Valve Trim Packages contain items B.1 through B.15 and associated nipples. Viking Accessory Package for Conventional Deluge Valve Trim contains B.2 through B.5, B.7 through B.11, and B.14.

. . . . . Dotted lines indicate electrical detection system wiring required but not listed in "System Components" Table. For additional wiring requirements refer to technical data for components used.

FIGURE 1: ANGLE DELUGE VALVE WITH CONVENTIONAL TRIM
1-1/2" VALVE SHOWN

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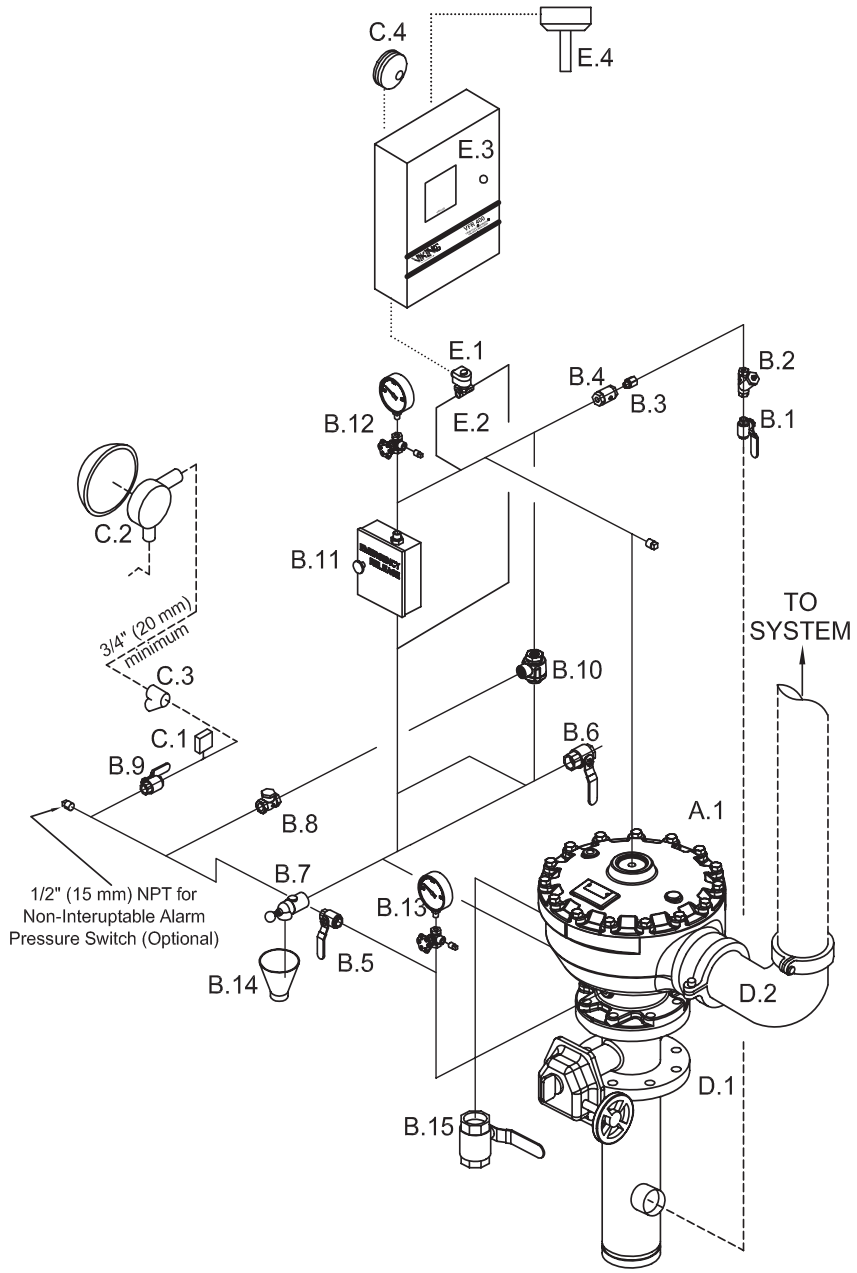

SYSTEM COMPONENTS

A. Valve
- A.1 Deluge Valve

B. Deluge Valve Conventional Trim *
(See Deluge Valve Conventional Trim Charts)
- B.1 Priming Valve
- B.2 Strainer
- B.3 1/16" Restricted Orifice
- B.4 Spring Loaded Check Valve
- B.5 Alarm Test Valve (Normally Closed)
- B.6 Auxiliary Drain Valve (Normally Closed)
- B.7 Drip Check Valve
- B.8 Drain Check Valve
- B.9 Alarm Shut-Off Valve (Normally Open)
- B.10 Pressure Operated Relief Valve (P.O.R.V.)
- B.11 Emergency Release
- B.12 Priming Pressure Water Gauge and Valve
- B.13 Water Supply Pressure Gauge and Valve
- B.14 Drain Cup
- B.15 Flow Test Valve (Normally Closed)

C. Water Flow Alarm Equipment
- C.1 Alarm Pressure Switch and/or
- C.2 Water Motor Alarm (Strainer Required)
- C.3 Strainer

D. Riser
- D.1 Water Supply Control Valve
- D.2 90° Ell. (Grooved Ell Shown. Deluge Valve also available with Flanged Outlet.)

E. Release System
- E.1 Solenoid Valve
- E.2 Electric Release Module Trim
- E.3 System Control Panel configured for Single Zone Deluge operation.
- E.4 Electric Detection System. Heat Detector shown for clarity.

--- Dashed lines indicate pipe required but not listed in "System Components" Table.

* Viking Deluge Valve Trim Packages contain items B.1 through B.15 and associated nipples. Viking Accessory Package for Conventional Deluge Valve Trim contains B.2 through B.5, B.7 through B.11, and B.14.

····· Dotted lines indicate electrical detection system wiring required but not listed in "System Components" Table. For additional wiring requirements refer to technical data for components used.

FIGURE 2: ANGLE DELUGE VALVE WITH CONVENTIONAL TRIM
6" VALVE SHOWN. ALSO AVAILABLE IN 2", 3", & 4".

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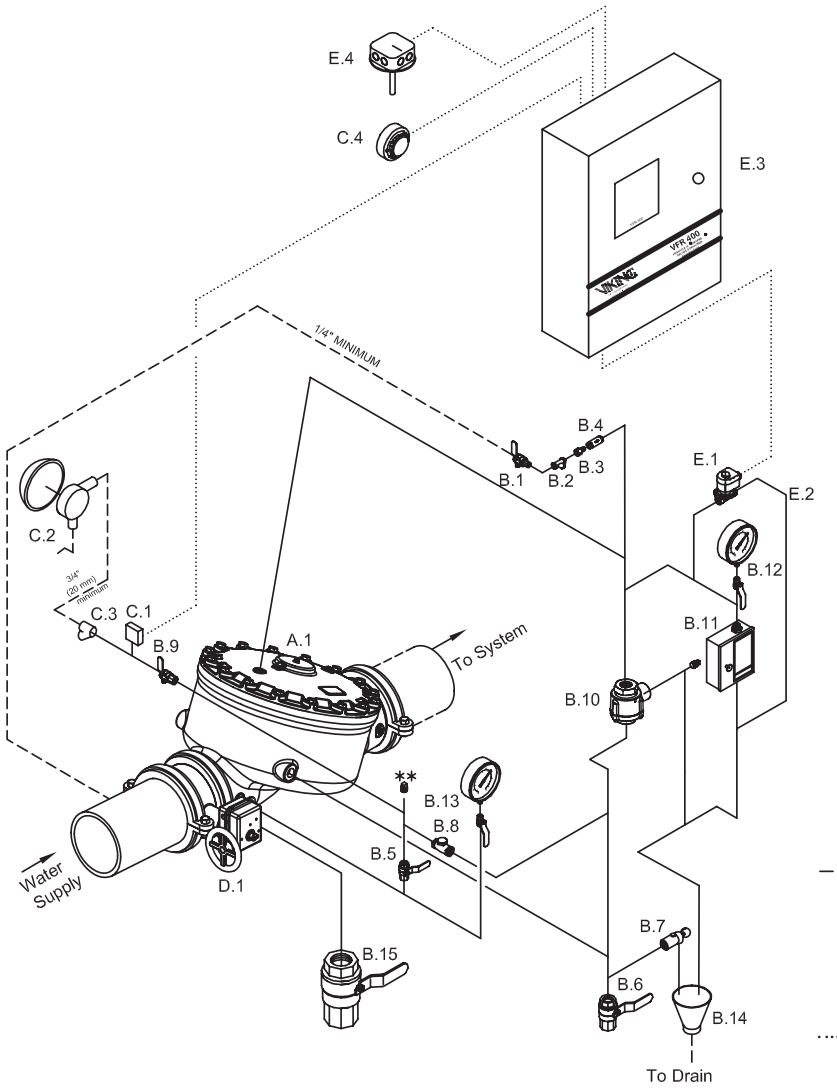

SYSTEM COMPONENTS

A. Valve
- A.1 Deluge Valve

B. Deluge Valve Conventional Trim *
(See Deluge Valve Conventional Trim Charts)
- B.1 Priming Valve
- B.2 Strainer
- B.3 1/16" Restricted Orifice
- B.4 Spring Loaded Check Valve
- B.5 Alarm Test Valve (Normally Closed)
- B.6 Auxiliary Drain Valve (Normally Closed)
- B.7 Drip Check Valve
- B.8 Drain Check Valve
- B.9 Alarm Shut-Off Valve (Normally Open)
- B.10 Pressure Operated Relief Valve (P.O.R.V.)
- B.11 Emergency Release
- B.12 Priming Pressure Water Gauge and Valve
- B.13 Water Supply Pressure Gauge and Valve
- B.14 Drain Cup
- B.15 Flow Test Valve (Normally Closed)

C. Water Flow Alarm Equipment
- C.1 Alarm Pressure Switch and/or
- C.2 Water Motor Alarm (Strainer Required)
- C.3 Strainer
- C.4 Electric Alarm Bell

D. Riser
- D.1 Water Supply Control Valve

E. Release System
- E.1 Solenoid Valve
- E.2 Electric Release Module Trim
- E.3 System Control Panel configured for Single Zone Deluge operation.
- E.4 Electric Detection System. Heat Detector shown for clarity.

– – – – Dashed lines indicate pipe required but not listed in "System Components" Table.

* Viking Deluge Valve Trim Packages contain items B.1 through B.15 and associated nipples. Viking Accessory Package for Conventional Deluge Valve Trim contains B.2 through B.5, B.7 through B.11, and B.14.

..... Dotted lines indicate electrical detection system wiring required but not listed in "System Components" Table. For additional wiring requirements refer to technical data for components used.

FIGURE 3: STRAIGHT THROUGH DELUGE VALVE WITH HORIZONTAL CONVENTIONAL TRIM
6" VALVE SHOWN. ALSO AVAILABLE IN 1-1/2", 2", 2-1/2", 3", 4" & 8".

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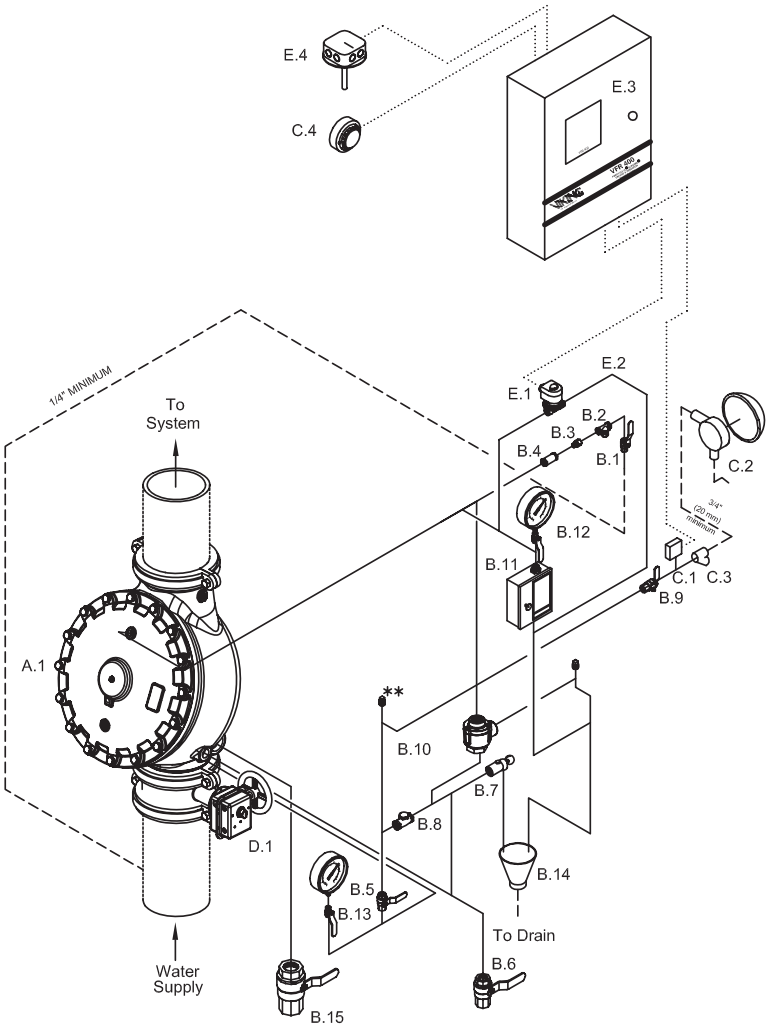

SYSTEM COMPONENTS

A. Valve
- A.1 Deluge Valve

B. Deluge Valve Conventional Trim *
(See Deluge Valve Conventional Trim Charts)
- B.1 Priming Valve
- B.2 Strainer
- B.3 1/16" Restricted Orifice
- B.4 Spring Loaded Check Valve
- B.5 Alarm Test Valve (Normally Closed)
- B.6 Auxiliary Drain Valve (Normally Closed)
- B.7 Drip Check Valve
- B.8 Drain Check Valve
- B.9 Alarm Shut-Off Valve (Normally Open)
- B.10 Pressure Operated Relief Valve (P.O.R.V.)
- B.11 Emergency Release
- B.12 Priming Pressure Water Gauge and Valve
- B.13 Water Supply Pressure Gauge and Valve
- B.14 Drain Cup
- B.15 Flow Test Valve (Normally Closed)

C. Water Flow Alarm Equipment
- C.1 Alarm Pressure Switch and/or
- C.2 Water Motor Alarm (Strainer Required)
- C.3 Strainer
- C.4 Electric Alarm Bell

D. Riser
- D.1 Water Supply Control Valve

E. Release System
- E.1 Solenoid Valve
- E.2 Electric Release Module Trim
- E.3 System Control Panel configured for Single Zone Deluge operation.
- E.4 Electric Detection System. Heat Detector shown for clarity.

– – – – Dashed lines indicate pipe required but not listed in "System Components" Table.

* Viking Deluge Valve Trim Packages contain items B.1 through B.15 and associated nipples. Viking Accessory Package for Conventional Deluge Valve Trim contains B.2 through B.5, B.7 through B.11, and B.14.

..... Dotted lines indicate electrical detection system wiring required but not listed in "System Components" Table. For additional wiring requirements refer to technical data for components used.

FIGURE 8: STRAIGHT THROUGH DELUGE VALVE WITH CONVENTIONAL VERTICAL TRIM
6" VALVE SHOWN. ALSO AVAILABLE IN 1-1/2", 2", 2-1/2", 3", 4" & 8".

Revised page replaces page 204a-h dated May 7, 2007.
(Updated drawings with new PORV.)