VIKING®

TECHNICAL DATA

MODEL E-2 DELUGE VALVE HALAR® COATED ANGLE STYLE

3" (DN80) - 6" (DN150)

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

Viking Deluge Valves are quick opening, differential diaphragm flood valves with one moving part. The Viking Model E-2 Halar® Coated Deluge Valve is identical to the Viking Model E-1 Deluge Valve, except the Model E-2 is manufactured with specially coated components.

The body and cover of the Model E-2 Deluge Valve is coated inside and outside with Halar® Coating consisting of ethylene chlorotrifluoroethylene (ECTFE). The coating makes the valve suitable for use in corrosive environments similar to those found on offshore platforms and many industrial chemical facilities. Coatings on internal operating parts of the valve also include PTFE, Electroless Nickel plating, and Tin plating. The Halar® Coated valve may be used to control water flow in deluge and preaction systems supplied by brackish or salt water when operation is controlled by fixed temperature hydraulic release systems. The Viking Stainless Steel Trim package is recommended for brackish or seawater applications. Also, the Viking Halar® Coated Deluge Valve has been satisfactorily evaluated as a Foam Concentrate Control Valve for use with AFFF or ATC foam in fixed foam/water sprinkler systems.

FEATURES

1. HALAR® COATING:
   a. Exceeds performance of Epoxy Coating or Kynar Coating
   b. Mechanical strength and toughness.
   c. High thermal stability
   d. High dielectric strength
   e. Resistant to most chemicals and solvents
   f. Resistant to cobalt 60 radiation
   g. All wetted surfaces are coated including pipe threads.
2. VALVE:
   a. Field replaceable Diaphragm and Seat Rubbers
   b. Designed for installation in any position (see INSTALLATION)
   c. Designed to be reset without opening the valve
   d. Compatible with Hydraulic, Pneumatic and Electric Release Systems

2. LISTINGS AND APPROVALS:

UL Listed - Guide VLFT & VLJH
FM Approved - Deluge Sprinkler Systems, Preaction Sprinkler Systems, Refrigerated Area Sprinkler Systems
American Bureau of Shipping (ABS): Certificate No. 03-HS405911B-2-PDA
CE - Pressure Equipment Directive 97/23/EC

3. TECHNICAL DATA

Specifications:
Available since 1994
Maximum Working Water Pressure: 250 PSI (17.4 bar)
90-degree pattern (inlet to outlet)
Connections Available - See Table 1.
Hydrostatically tested to: 350 PSI (24.1 bar) at factory
Valve differential: Approximately 2:1 (priming chamber to inlet chamber)
Color of Halar® Coated Valve: Black
Friction Loss: Refer to Table 1.
Cv Factor: Refer to Table 1.
Coating Specifications: Refer to Table 2.

Material Specifications:
Refer to Figure 2.
Halar® Coating Specification: See Table 2.
Electroless Nickel and Tin Plating Specifications: See Table 2.
PTFE Coating Specification: See Table 2.

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DESCRIPTION	NOMINAL SIZE	PART NUMBER	FRICTION LOSS *	CV FACTOR	SHIPPING WEIGHT
Flange/Flange					
Flange Drilling					
ANSI	3"	08362Q/B	29 ft. (8.8 m)	187	74 lbs. (34 kg)
ANSI	4"	08363Q/B	35 ft. (10.7 m)	470	120 lbs. (54 kg)
ANSI	6"	08364Q/B	33 ft. (10.1 m)	1088	250 lbs. (113 kg)
PN10/16	DN80	08862Q/B	29 ft. (8.8 m)	187	74 lbs. (34 kg)
PN10/16	DN100	08863Q/B	35 ft. (10.7 m)	470	120 lbs. (54 kg)
PN10/16	DN150	08864Q/B	33 ft. (10.1 m)	1088	250 lbs. (113 kg)
Flange/Groove					
Flange Drilling / Pipe O.D.					
ANSI / 89 mm	3"	11064Q/B	29 ft. (8.8 m)	187	65 lbs. (30 kg)
ANSI / 114 mm	4"	11065Q/B	35 ft. (10.7 m)	470	111 lbs. (50 kg)
ANSI / 168 mm	6"	11001Q/B	33 ft. (10.1 m)	1088	236 lbs. (107 kg)
PN10/16 / 168 mm	DN150	11001Q/B	33 ft. (10.1 m)	1088	236 lbs. (107 kg)

$$Q = Cv \sqrt{\frac{\Delta P}{S}}$$

Q= Flow
Cv= Flow Factor (GPM/1 PSI ΔP)
ΔP= Pressure Loss through Valve
S= Specific Gravity of Fluid

* Expressed in equivalent length of pipe based on Hazen & Williams Formula C=120.

Table 1 - Valve Part Numbers and Specifications

[1] Valves marked with ANSI for drilling patterns indicate ANSI B16.42 Class 150. Systems with water working pressures above 175 PSI (12 bar) may require extra-heavy pattern fittings. ANSI B16.42 Class 150 flanges are NOT compatible with ANSI Class 250 or Class 300 flanges. To mate the Model F-2 Deluge Valve with ANSI Class 250 or Class 300 flanges, use listed flange adapters of the appropriate pressure rating. For piping with grooved connections, the valve may be installed with listed grooved couplings of the appropriate pressure rating.

Ordering Information:
Part Numbers: Refer to Table 1.
Shipping weight: Refer to Table 1.

Accessories:

1. A Conventional trim package for use with the Model E Deluge Valve is available. When the Halar® Coated Deluge Valve is used on systems with fresh water supplies, Viking E Deluge Valve trim sets may be used. The trim sets include the VALVE ACCESSORY package and the fittings and nipples shown on the Deluge Valve Conventional Trim Charts for the valve used.
2. Where brackish or seawater is used, it is recommended that Viking Stainless Steel Trim package be used. This includes 316 stainless steel valves, pipe and fittings with brass electroless nickel-plated devices.
3. A Brass trim package is available for use when the Halar® Coated Deluge Valve is used as a FOAM CONCENTRATE CONTROL VALVE for AFFF or ATC Foam Concentrate. See the Viking website.

Additional accessories are available and may be required for system operation or supervision. Refer to the system description and technical data for complete operating trim requirements for the system used.

4. INSTALLATION

Note: For INSTALLATION instructions for using the Halar® Coated Deluge Valve as a Foam Concentrate Control Valve, refer to the Viking website.

A. General Instruction

1. Viking Deluge Valves may be installed in any position.

NOTE: MINOR MODIFICATION OF TRIM MAY BE REQUIRED TO FACILITATE DRAINAGE FROM OUTLET CHAMBER OF THE DELUGE VALVE.

2. When the Viking Halar® Coated Deluge Valve is used on systems supplied with brackish water, salt water, foam/water (pre-mixed) solution, or any other corrosive water supply, consult Table 2 for trim material specifications. Check with manufacturer prior to using this valve with fluids other than fresh water and those listed in Table 2.

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3. When the Halar® Coated Deluge Valve is supplied with anything other than clean fresh water, such as salt water or brackish water, conventional trim should not be utilized. Stainless steel or brass trim should be used for installations that are supplied with water supplies other than clean fresh water.
4. Use caution when using wrenches on or around Halar® Coated Valves. Halar® Coating may chip when struck with hard or sharp objects. If the Halar® coating becomes chipped, immediately repair the damaged area to inhibit the potential for corrosion. Refer to paragraph 6.3.D and Halar® Coating Repair instructions.
5. Halar® Coating is black in color. Due to its chemical resistance paint will not adhere to Halar® Coating sufficiently to resist abrasion.
6. The valve must be installed in an area not subject to freezing temperatures or physical damage.
7. The valve must be trimmed according to current Viking Trim Charts and appropriate instructions for the application. Trim Charts are available on the Viking website and are provided with trim packages.
   a. When the Halar® Coated Deluge Valve is used on deluge or preaction systems where standard trim is required and allowed, the valve must be trimmed according to Viking Model E-1 Trim Charts for the system used. For additional trim connections, refer to technical data describing the system being installed.
   b. Trim Note: Discharge piping from the auxiliary drain (globe) valve, the main drain (angle) valve in the deluge valve trim, and all system drains should be kept separate to prevent unwanted operation of the deluge valve. When drains are interconnected and the auxiliary drain is damaged or not closed tightly, discharge from any other drain, could flood the outlet chamber of the deluge valve, pressurize the PORV to operate the deluge valve or flood the system piping. Also to prevent unwanted operation of the deluge valve, do NOT connect the outlet of the drip check to any other drain.
8. The priming line must be connected upstream of the system water supply main control valve or to a constant source of water at a pressure equal to the system water supply.
9. After the deluge valve is set, operation of the deluge valve requires the release of priming water from the priming chamber. This may be by automatic or manual operation of the release system. Viking deluge valves are compatible with hydraulic, pneumatic, and electric release systems. For specific trim arrangements refer to Technical Data describing the system being installed.
   a. Hydraulic Release Systems: See Figures 3 - 6 for the maximum allowable elevation of hydraulic release piping above the Deluge Valve.
   b. Pneumatic Release Systems: A Viking pneumatic actuator is required between the emergency release in the deluge valve Trim and the pneumatic release piping.
   c. Electric Release: Solenoid valves, release control panels, and electrical detectors must be compatible. Consult appropriate listing and/or approval guides.

⚠ CAUTION

Operation of Viking Deluge Valves by pressurizing the priming chamber with air pressure or any other pressurized gas is not recommended or approved.

B. Placing the Valve in Service

1. Verify that the system water supply main control valve is closed, and the Halar® Coated Deluge Valve is trimmed according to current Viking Trim Charts, and schematic drawings for the system being installed.
2. Open the main drain (angle) valve in the deluge valve trim.
3. Open the auxiliary drain (globe) valve in the deluge valve trim. Drain all water from the outlet chamber of the deluge valve.
4. For preaction systems, open the system main drain located on (or down stream from) the rubber seated check valve in the sprinkler system riser being supplied by the deluge valve.
5. Verify that all water has been drained from the system. Open all auxiliary drains and the system test valve to vent the system and drain any water contained in low points of the system piping. Allow enough time for the system to drain completely.
6. After the sprinkler system has completely drained, close all drains opened in steps No. 4 and 5 above. Keep the auxiliary drain (globe) valve and the main drain (angle) valve in the deluge valve trim open.
7. Set the release system. (See release system description and Technical Data for the system used). The emergency release must be closed.
8. Open the priming line supply valve and pressurize the priming chamber. The pressure on the priming chamber water pressure gauge must be equal to the system water supply pressure.
9. Close the auxiliary drain (globe) valve in the deluge valve trim.
10. Partially open the water supply main control valve. When water flows from the main drain, slowly close the main drain (angle) valve.
11. Open the water supply main control valve completely and secure.
12. Depress the drip check to drain any remaining water from the outlet chamber of the deluge valve.

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ANGLE STYLE
3” (DN80) - 6” (DN150)

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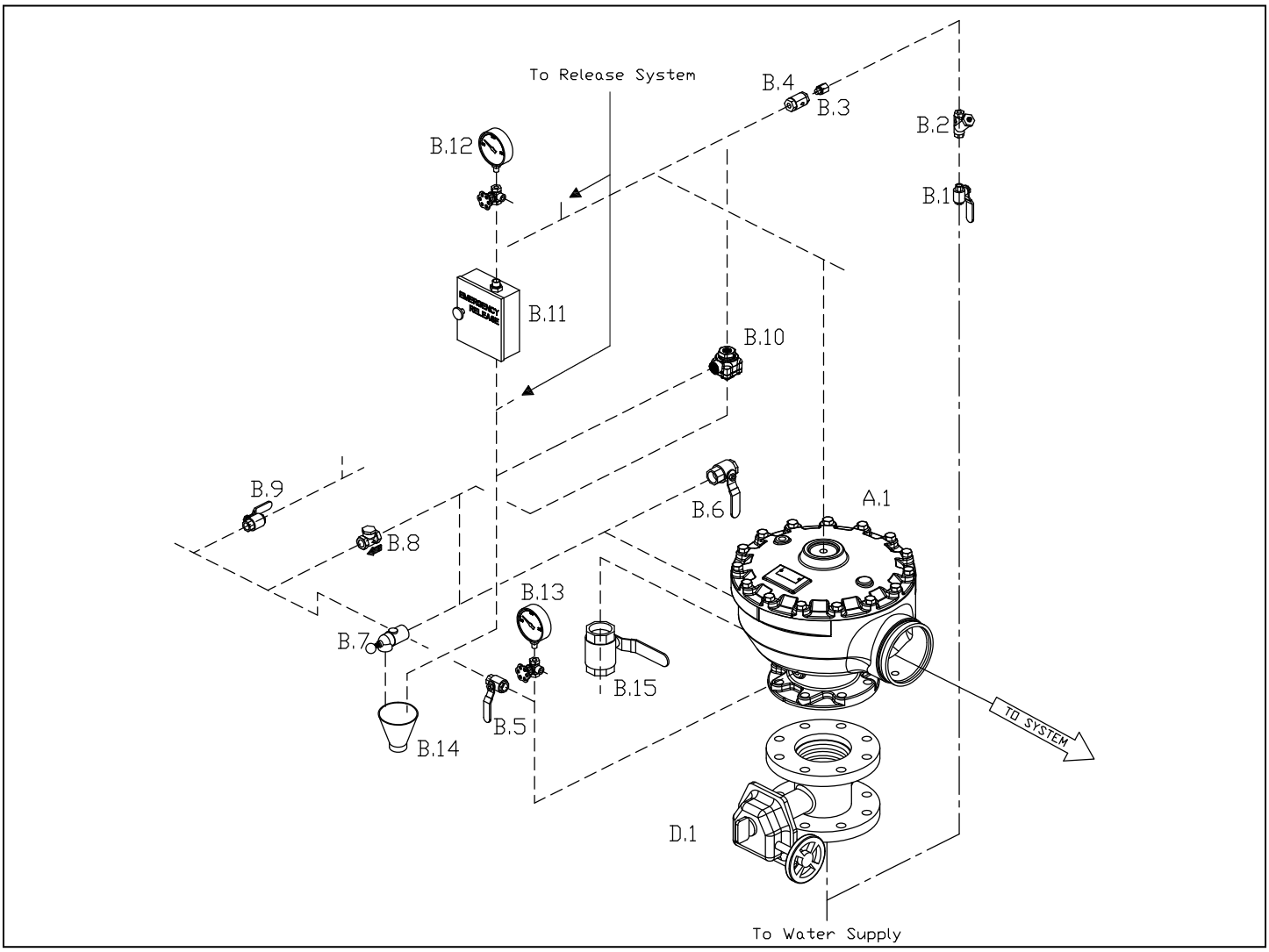

- - - - - Dashed lines indicate nipples and fittings included with trim.
—·—·— Phantom lines indicate piping required, but not included with trim.

Figure 1 - Trim Components

A.1	Deluge Valve	B.9	Alarm Shut Off Valve (Normally Open)
B.1	Priming Valve (Normally Open)	B.10	Pressure Operated Relief Valve (PORV)
B.2	Strainer	B.11	Emergency Release
B.3	1/16" Restricted Orifice	B.12	Priming Pressure Water Gauge and Valve
B.4	Spring Loaded Check Valve	B.13	Water Supply Pressure Water Gauge and Valve
B.5	Alarm Test Valve (Normally Closed)	B.14	Drain Cup
B.6	Auxiliary Drain Valve (Normally Closed)	B.15	Flow Test Valve (Normally Closed)
B.7	Drip Check Valve	D.1	Water Supply Control Valve
B.8	Drain Check Valve		

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13. Verify:
    a. The auxiliary drain (globe) valve in the deluge valve trim is CLOSED.
    b. The main drain (angle) valve in the deluge valve trim is CLOSED.
    c. The alarm test shut-off valve in the deluge valve trim is in ALARM position.
    d. All other valves are in their normal operating position and secure.
    e. The water supply main control valve is fully OPEN and properly locked or supervised.
    f. All equipment is adequately heated and protected to prevent freezing and physical damage.
    g. Check for, and repair all leaks.
14. On new installations, those systems that have been placed out of service or where new equipment has been installed, trip test the system to verify that all equipment functions properly. See ANNUAL maintenance instructions.

⚠ CAUTION

Performing a trip test results in operation of the Deluge Valve. Water will flow into the sprinkler piping. Take necessary precautions to prevent damage.

15. After completing a trip test, perform SEMI-ANNUAL maintenance.

C. Valve Removed From Service

NOTE: WHEN A VALVE HAS BEEN REMOVED FROM SERVICE AND IS SUBJECT TO FREEZING OR WILL BE OUT OF SERVICE FOR AN EXTENDED PERIOD OF TIME, ALL WATER MUST BE REMOVED FROM THE PRIMING CHAMBER, TRIM PIPING, WATER SUPPLY PIPING AND OTHER TRAPPED AREAS.

5. OPERATION (Refer to Figures 1 and 2.)

NOTE: FOR OPERATION OF THE HALAR® COATED DELUGE VALVE USED AS A FOAM CONCENTRATE CONTROL VALVE, REFER TO THE VIKING FOAM ENGINEERING AND DESIGN DATA BOOK.

The deluge valve has an inlet, outlet and priming chamber. The inlet and outlet are separated from the priming chamber by the valve clapper (6) and diaphragm rubber (2). System supply pressure enters the priming chamber through the priming line and strainer orifice check valve connected to the priming chamber inlet.

In the set condition:

System pressure is supplied to the priming chamber through a restricted priming line (trim) equipped with a check valve. System water supply pressure trapped in the priming chamber causes the rolling diaphragm assembly to seal the rubber-seated clapper (6) against the water seat (9).

The pressure in the priming chamber holds the deluge valve clapper closed, keeping the outlet chamber and system piping dry.

In fire conditions:

When the release system operates, pressure is released from the priming chamber faster than it is supplied through the restricted priming line. Water supply pressure in the inlet chamber forces the rolling diaphragm assembly to move clapper (6) off from seat (9), allowing water to flow through the outlet and into the system and alarm devices.

For Deluge Valves equipped with Conventional Trim:

When the deluge valve operates, the sensing end of the PORV (B.10) is pressurized, causing the PORV (B.10) to operate. When the PORV (B.10) operates, it continually vents the priming chamber to prevent the deluge valve from resetting even if the open releasing devices close. The deluge valve can only be reset after the system is taken out of service, and the outlet chamber of the deluge valve and associated trim piping is depressurized and drained.

6. INSPECTIONS, TESTS AND MAINTENANCE

NOTICE

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. The Deluge Valve must be kept from freezing conditions and physical damage that could impair its operation.

⚠ WARNING

Any system maintenance which 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.

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I. Inspection

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 or corrosive atmospheres. Also, the alarm devices, detection systems or other connected trim may require a more frequent schedule. For minimum maintenance and inspection requirements, refer to NFPA 25. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements which must be followed. The following recommendations are minimum requirements.

A. Weekly - Weekly visual inspection of the Viking deluge valve is recommended.

1. Verify that the main water supply control valve is open and that all other valves are in their normal operating position and appropriately secured.
2. Check for signs of mechanical damage, leakage, and/or corrosive activity. If detected, perform maintenance as required. If necessary, replace the device.
3. Verify that the valve and trim are adequately heated and protected from freezing and physical damage.

II. Tests

A. Quarterly Water Flow Alarm Test

Quarterly testing of water flow alarms and performance of a Main Drain Test is recommended and may be required by the Authority Having Jurisdiction.

1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. To test the local electric alarm (if provided) and/or mechanical water motor alarm (if provided), OPEN the alarm test valve (B.5) in the deluge valve trim.
   a. Electric alarm pressure switches (if provided) should activate.
   b. Electric local alarms should be audible.
   c. The local water motor gong should be audible.
   d. If equipped with remote station alarm signaling devices, verify that alarm signals were received.
3. When testing is complete, CLOSE the alarm test valve (B.5).
4. Verify:
   a. All local alarms stop sounding and alarm panels (if provided) reset.
   b. All remote station alarms reset.
   c. Supply piping to water motor alarm properly drains.
5. Verify that the alarm shut-off valve (B.9) is OPEN, and the alarm test valve (B.5) is CLOSED.
6. Verify that the outlet chamber is free of water. No water should flow from the drip check (B.7) when the plunger is pushed.
7. Notify the Authority Having Jurisdiction and those in the affected area that testing is complete.

B. Quarterly Main Drain Test

1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. Record pressure reading from the water supply pressure gauge (B.13).
3. Verify that the outlet chamber of the deluge valve is free of water. No water should flow from the drip check (B.7) when the plunger is pushed.
4. Fully OPEN the flow test valve (B.15).
5. When a full flow is developed from the flow test valve (B.15), record the residual pressure from the water supply pressure gauge (B.13).
6. When the test is complete, SLOWLY CLOSE the flow test valve.
7. Compare test results with previous flow information. If deterioration of the water supply is detected, take appropriate steps to restore adequate water supply.
8. Verify:
   a. Normal water supply pressure has been restored to the inlet chamber, the priming chamber, and the release system. The pressure on the priming chamber water pressure gauge should equal the system water supply pressure.
   b. All alarm devices and valves are secured in normal** operating position.
9. Notify the Authority Having Jurisdiction that the test is complete. Record and/or provide notification of test results as required by the Authority Having Jurisdiction.

**For normal operating position, refer to Figure 1 and/or Trim Charts and System Data for the system used.

C. Annual Trip Test

⚠ CAUTION
Performing a trip test results in operation of the Deluge Valve. Water will flow into the sprinkler piping. Take necessary precautions to prevent damage.

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1. Notify the Authority Having Jurisdiction and those in the area affected by the test.
2. Fully open the flow test valve (B.15) to flush away any accumulation of foreign material.
3. Close the flow test valve (B.15).
4. Trip the system by operating the release system. Allow a full flow to pass through the deluge valve. Water flow alarms should operate.
5. When test is complete:
   a. Close the main water supply control valve (D.1).
   b. Close the priming valve (B.1).
   c. Open the auxiliary drain valve (B.6).
   d. Open all system main drains and auxiliary drains. Allow the system to drain completely.
6. Perform SEMI-ANNUAL maintenance. Refer to paragraph 6.III.B.
7. Place the system in service. Refer to Item 4.B INSTALLATION: PLACING THE VALVE IN SERVICE.

NOTE: DELUGE VALVES SUPPLIED BY BRACKISH WATER, SALT WATER, FOAM, FOAM/WATER SOLUTION, OR ANY OTHER CORROSIVE WATER SUPPLY SHOULD BE FLUSHED WITH GOOD QUALITY FRESH WATER BEFORE BEING RETURNED TO SERVICE.

8. Notify the Authority Having Jurisdiction that the test is complete. Record and/or provide notification of test results as required by the Authority Having Jurisdiction.

III. Maintenance

A. After Each Operation:

1. 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.
2. Deluge Valves and trim that have been subjected to brackish water, salt water, foam, foam/water solution, or any other corrosive water supply, should be flushed with good quality fresh water before being returned to service.
3. Perform SEMI-ANNUAL maintenance after every operation.

B. Semi-Annual Maintenance:

1. Remove the system from service. (See release system description and technical data for additional information.)
   a. Close the water supply main control valve.
   b. Open the main drain (angle) valve in the deluge valve trim.
   c. Open auxiliary drain (globe) valve in the deluge valve trim. Allow the outlet chamber of the deluge valve to drain completely.
   d. Check for water in the system piping. For preaction systems, open the system main drain located on (or down stream from) the rubber seated check valve in the sprinkler system riser being supplied by the deluge valve. If water is detected or if the system has operated, allow the system to drain completely. Open all auxiliary drains and the system test valve to vent the system and drain any low points of the system piping. Allow enough time for the system to drain completely.
   e. Relieve the pressure in the priming chamber by opening the emergency release valve.
2. Inspect all trim for signs of corrosion and/or blockage. Clean and/or replace as required.
3. Clean and/or replace all strainer screens. See maintenance instructions in the strainer orifice check valve technical data.
4. Check Halar® coating of the Deluge Valve for physical damage. If necessary, make repairs to the affected area to inhibit potential corrosion. Refer to paragraph 6.III.D - Halar® Coating Repair instructions .
5. Refer to Item 4.B, INSTALLATION: PLACING THE VALVE IN SERVICE.

C. Every Fifth Year

1. Internal inspection of deluge valves is recommended every five years unless inspections and tests indicate more frequent internal inspections are required. Refer to DISASSEMBLY instructions provided below.
2. Internal inspection of strainers and restricted orifices is recommended every five years unless inspections and tests indicate more frequent internal inspections are required.
3. Record and provide notification of inspection results as required by the Authority Having Jurisdiction.

D. Halar® Coating Repair

If the Halar® coating becomes chipped, immediately repair the damaged area to inhibit the potential for corrosion. Follow instructions below:

1. Wipe clean and prepare the area to be repaired as instructed.
2. Using a hand held torch, gently heat the Halar® coating around the area needing repair to the melting point of the Halar®.
3. Allow the heated Halar® to flow together.
4. Allow the coating to cool.

E. Valve Disassembly

1. Remove the valve from service (see the release system description and Technical Data for additional information). Close the main control valve, open the main drain valve. Release the pressure in the priming chamber by opening the emergency release Valve.

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2. Disconnect and remove necessary trim from the cover.
3. Remove the cover (3):
   a. Remove each of the cap screws (7) and break the seal of the cover.
      i. For 3” and 4” valves, use a Socket Wrench with a 3/4” socket.
      ii. For 6” valves, use a Socket Wrench with a 15/16” socket.
   b. Lift the cover (3) off the valve body (1) and gently set it aside.

F. Installing Replacement Parts and Valve Reassembly (Refer to Figure 2.)

1. To replace the entire clapper assembly, which is ordered pre-assembled:
   a. Remove the old clapper assembly (2, 4, 5, 6, 7, 8, and 10) by placing a flat head screwdriver between the body (1) and the diaphragm rubber and then lifting the clapper assembly from valve body (1).
   b. Inspect the seat (9).

NOTE: Prior to reassembly, flush the valve of all foreign matter. The valve seat (9) must be clean and free from all marks and scratches.

   c. Install the new clapper assembly kit (2, 4, 5, 6, 7, 8, and 10).

If the entire clapper assembly does not need to be replaced, each of the parts of the clapper assembly kit are offered individually for replacement.

2. To replace the clamp ring (4):
   a. Remove each of the screws (5):
      i. For 3” valves, use a Phillips head screwdriver.
      ii. For 4” valves, use a Socket Wrench with a 1/2” socket.
      iii. For 6” valves, use a Socket Wrench with a 9/16” socket.
   b. Remove the existing clamp ring from the diaphragm rubber (2).

NOTE: When replacing the clamp ring (4) on the 3” size only, notice there is a groove in the seat of the clamp ring (4). This groove must be placed into the raised groove of the diaphragm rubber (2). On the 4” and 6” valves, the clamp ring (4) doesn’t have a grooved seat; there is a rounded edge and there is a sharp edge on the clamp ring (4). When installing the clamp ring (4) on the 4” and 6” valves, the rounded edge of the clamp ring (4) needs to be facing down towards the clapper (6).

   c. When installing the new clamp ring (4), install the new screws (5) in a star-shaped pattern using the tools indicated in Step 2a above.

3. To replace the diaphragm rubber (2):
   a. Remove the diaphragm rubber (2) by removing the clamp ring (4) as indicated in Step 2 above and then removing the diaphragm rubber (2) from the clapper assembly.

NOTE: In the 3” valve, the diaphragm rubber (2) has a raised groove, which fits into the grooved seat of the clamp ring (4). With the 4” and 6” valves, there is no grooved seat in the clamp ring (4) or a raised edge on the top of the diaphragm rubber (2). The raised edge on the diaphragm rubber (2) is on the <u>bottom</u> and it fits into the grooved seat of the clapper (6) itself.

   b. To install the new diaphragm rubber (2) on the 3” valve, simply fit it into the clapper (6). To install the new diaphragm rubber (2) on the 4” and 6” valves, install the groove of the diaphragm rubber (2) into the clapper (6) itself.

NOTE: PRIOR TO INSTALLING A NEW DIAPHRAGM RUBBER (2) OR SEAT RUBBER ASSEMBLY (8), MAKE CERTAIN THAT ALL SURFACES ARE CLEAN AND FREE OF FOREIGN MATTER. THE SEAT (9) MUST BE SMOOTH AND FREE OF NICKS, BURRS OR INDENTATIONS.

4. To replace the seat rubber assembly (8):
   a. Remove each of the screws (10).
      i. For 3” valves, use a Phillips head screwdriver.
      ii. For 4” valves, use a Socket Wrench with a 1/2” socket.
      iii. For 6” valves, use a Socket Wrench with a 9/16” socket.
   b. Remove the old seat rubber assembly (8) from the clapper (6).
   c. Install the new seat rubber assembly (8).

NOTE: There is a raised edge on the rubber itself. Install with the raised edge facing down into the grooved seat of the clapper (6).

   d. Install the new screws (10) into the seat rubber assembly (8) in a star-shaped pattern using the wrenches indicated in Step 4a above.

5. To replace the clapper (6) itself:
   a. First, remove the clamp ring (4), diaphragm rubber (2), and the seat rubber assembly (8) from the old clapper (6) as described in the previous steps and then install them onto the new clapper (6).
6. To re-install the cover (3), line up the holes and install the cap screws (7) into the cover (3) in a star-shaped pattern.
   a. For 3” and 4” valves, use a Socket Wrench with a 3/4” socket.
   b. For 6” valves, use a 15/16” Socket Wrench with a 15/16” socket.

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Table 2 - Coating and Plating Specifications

Halar® Coating specification: Viking Specification SPF02-Q06 - Ethylene and Chlorotrifluoroethylene (Powder)

Total Thickness: .008" - .010" (.20 mm - .25 mm) applied as follows:

1. Parts are cleaned and sandblasted for proper adhesion and performance.
2. Primer base powder and Halar® clear powder coat applied using Electrostatic Spray system.
3. Powder is fusion bonded and cured in oven, and allowed to cool.

Electroless Nickel Plating Specification: Viking Specification SPF02-J07

Total thickness: .002" - .0025" (.05 mm - .06 mm) applied for corrosion resistance as follows:

1. Parts are cleaned and rinsed for proper adhesion.
2. Parts are chemically activated for adhesion of plating.
3. Finish plate with .002" - .0025" (.05 mm - .06 mm) Electroless Nickel Phosphorus plating.
4. Apply .0002" - .0003" (.005 mm - .007 mm) Tin/Lead plating to seat/rubber contact surface.

PTFE Coating Specification: Viking Specification SPF02-N05 - PTFE Powder Coating

Total thickness: .002" - .0025" (.05 mm - .06 mm) PTFE powder coating applied as follows:

1. Parts are cleaned and burned off in oven.
2. Parts are etched for adhesion by grit blasting.
3. PTFE powder is electrostatically applied to .002" - .0025" (.05 mm - .06 mm).
4. Powder is fusion bonded and cured in oven, and allowed to cool.

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Table 3 - Trim Piping Materials Chart

VALVE CONTROLLING:	TRIM PIPING MATERIAL
Fresh Water Only	Standard - See Note 1.
Sea Water Only AFFF/Sea Water Premix Solution ARC/Sea Water Premix Solution	316 Stainless Steel or 400 Monel. See Notes 2 and 4.
AFFF/Fresh Water Premix Solution	Black Steel, Copper, Stainless Steel or 400 Monel. See Notes 3 and 4.
AFFF/Fresh Water Premix Solution	Black Steel, Copper, Stainless Steel or 400 Monel. See Notes 3 and 4.
AFFF Foam Concentrate in pipes 2" (DN50) and larger	Black Steel, Copper, Stainless Steel or 400 Monel. See Note 3 and 4.
AFFF Foam Concentrate in pipes smaller than 2" (DN50)	Copper 316, Stainless Steel or 400 Monel. See Note 4.
ARC Foam Concentrate	Stainless Steel or 400 Monel. See Notes 4 and 5.

Note 1 - Standard Trim sets available from Viking consist of galvanized nipples and fittings. Includes ACCESSORY PACKAGE.

Note 2 - After operation, the valve & trim should be flushed with good quality fresh water before being returned to service.

Note 3 - Copper trim sets are not available from Viking. They may be manufactured by installer. Refer to Model E Deluge Valve Trim Charts provided in the *Viking Engineering and Design Data* book for required configuration of trim, sizes and llengths of nipples and components required.

Note 4 - Monel trim sets are not available from Viking. They may be manufactured by installer. Refer to Model E Deluge Valve Valve Trim Charts provided in the *Viking Engineering and Design Data* book for required configuration of trim, sizes and lengths of nipples and components required.

Note 5 - DO NOT allow ARC Foam Concentrate to enter the priming chamber of the Deluge Valve. When using the Halar® Coated Deluge Valve as a Foam Concentrate Control Valve, refer to the *Viking Foam Systems Engineering and Design Data* book for trim charts, technical data and special instructions

TECHNICAL DATA

MODEL E-2 DELUGE VALVE
HALAR® COATED
ANGLE STYLE
3” (DN80) - 6” (DN150)

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SIZE	A	B	C	D	E	F*
3” (DN80)	7” (178)	5” (127)	4–1/4” (108)	5–3/8” (137)	7–1/2” (190,5)	3/4” (19,05)
4” (DN100)	9” (229)	6–1/2” (165)	5–1/4” (133)	7” (178)	9” (228,6)	15/16” (23,81)
6” (DN150)	12” (305)	8” (203)	7” (178)	9–1/8” (232)	11” (279,4)	1” (25,4)

Dimensions shown in parentheses are millimeter.
*4”& 6” valves manufactured with sculptured flanges. Dimension indicates thickness of flange at bolt holes.

3”, 4”, OR 6” MODEL E–2 DELUGE VALVE

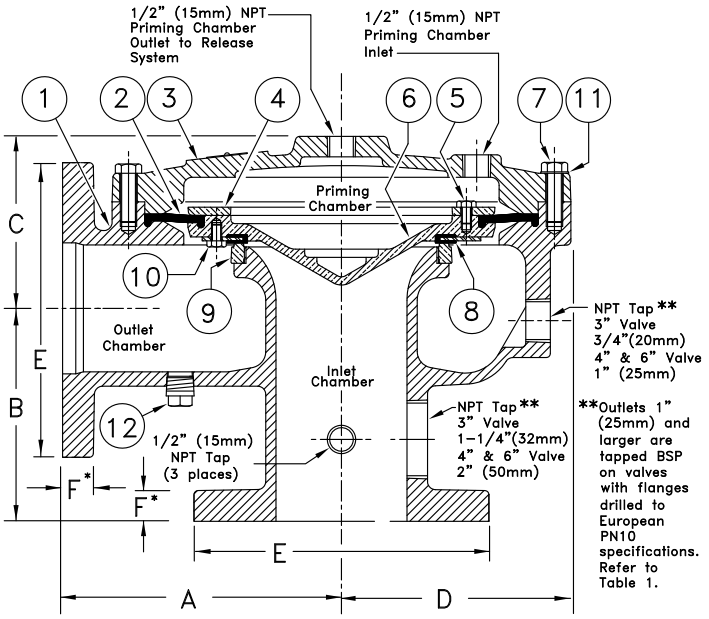

Figure 2 - Replacement Parts

ITEM NO.	PART NUMBERS 3" (DN80)	4" (DN100)	6" (DN150)	DESCRIPTION	MATERIAL	NO. REQ'D 3" (DN80)	4" (DN100)	6" (DN150)
1	—	—	—	Body	Halar® Coated Ductile Iron: 60-40-18 or 65-45-12	1	1	1
2	02492C	02377B	01974C	Diaphragm Rubber	EPDM ASTM D-2000	1	1	1
3	--	--	--	Cover	Ductile Iron Ductile Iron: 65-45-12	1	1	1
4	02493BN	02378BN	05704BN	Clamp Ring	PTFE Coated Brass: UNS-C84400	1	1	1
5				Screw, R.H., No. 10-24 x ½" (12.7 mm) Lg.	#400 Monel			
	08214			Screw, R.H., No. 10-24 x ½" (12.7 mm) Lg.	#400 Monel	6		
		08217		Screw, H.H.C., 5/16"-18 x ½" (12.7 mm) Lg.	#400 Monel		8	
			08218	Screw, H.H.C., 3/8"-16 x 5/8" (15.9 mm) Lg.	#400 Monel			12
6	08846N	08844N	08570N	Clapper	PTFE Coated Brass: UNS-C84400 or Ductile Iron: 65-45-12	1	1	1
7				Screw, H.H.C., 3/8" - 16 x 1-1/8" (28.6 mm) Lg.	Stainless Steel: UNS-S30400			
	08081			Screw, H.H.C., ½"-13 x 1-1/4" (31.8 mm) Lg.	Stainless Steel: UNS-S30400	10		
		08083		Screw, H.H.C., ½"-13 x 1-1/2" (38.1 mm) Lg.	Stainless Steel: UNS-S30400		12	
			08085	Screw, H.H.C., 5/8"-11 x 1-3/4" (44.5 mm) Lg.	Stainless Steel: UNS-S30400			15
8	02497B	02382B	02176B	Seat Rubber Assembly	EPDM ASTM D-2000 and Stainless Steel UNS-S30400	1	1	1
9	—	—	—	Seat	Plated Brass: UNS-C84400	1	1	1
10				Screw, R.H., No. 10-24 x ½" (12.7 mm) Lg.	# 400 Monel			
	08215			Screw, R.H., No. 10-24 x 3/8" (9.5 mm) Lg.	# 400 Monel	6		
		08217		Screw, H.H.C., 5/16"-18 x ½" (12.7 mm) Lg.	# 400 Monel		8	
			08882	Screw, H.H.C., 3/8" - 16 x ½" (12.7 mm) Lg.	# 400 Monel			12
11	08413	08413	08414	Washer	300 Series Stainless Steel	10	12	15
12	—	—	—	Plug, ½" (15 mm) NPT	Stainless Steel	1	1	1
-- Indicates replacement part not available								
SUB-ASSEMBLY LIST								
2, 4-8, 10, 11	13398	13481	13483	Clapper Assembly Kit				

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Maximum Allowable Pilot Heights for Select Equivalent Lengths of Hydraulic Release Piping
Model E-2 Deluge Valves with 1/16” (1.6 mm) Restricted Orifice
Graph is based on 1/2” (15 mm) pilot sprinklers installed on 1/2” (15 mm) schedule 40 galvanized release system piping.
If the maximum height of hydraulic release piping exceeds the limits shown on the graph, use Pneumatic or Electric Release System.

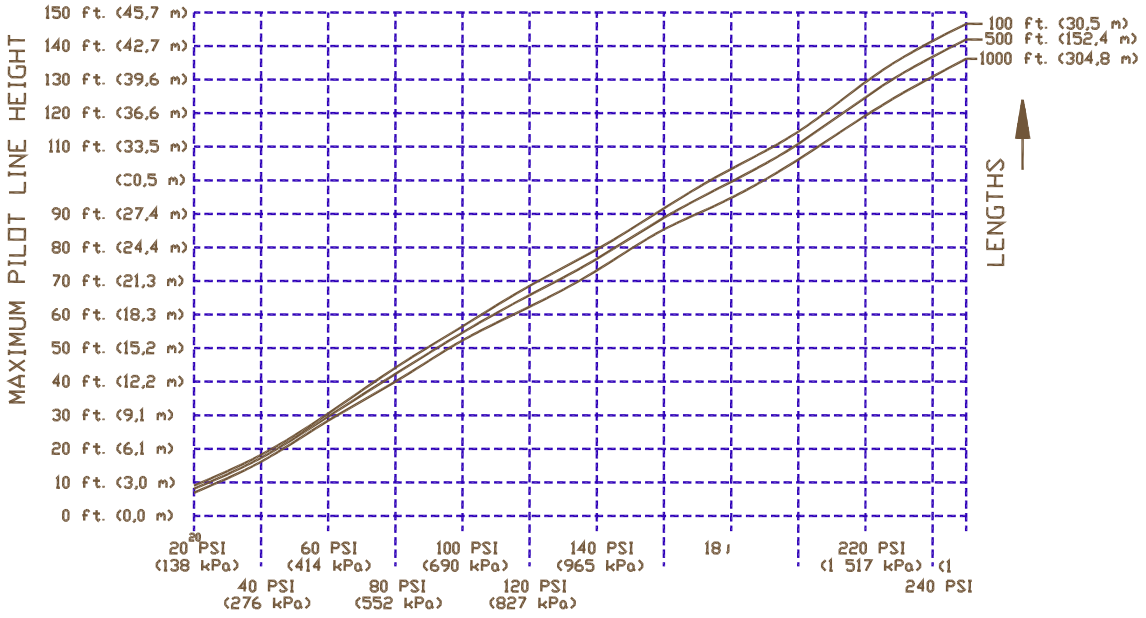

Figure 3 - 3” Valve

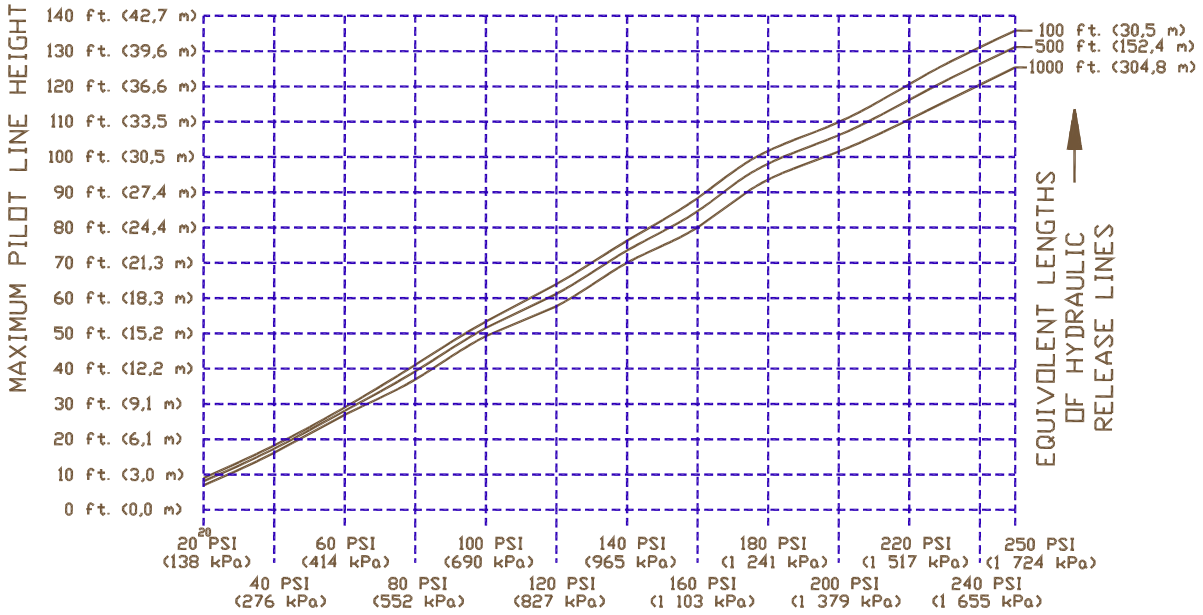

Figure 4 - 4” Valve

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TECHNICAL DATA

MODEL E-2 DELUGE VALVE
HALAR® COATED
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3” (DN80) - 6” (DN150)

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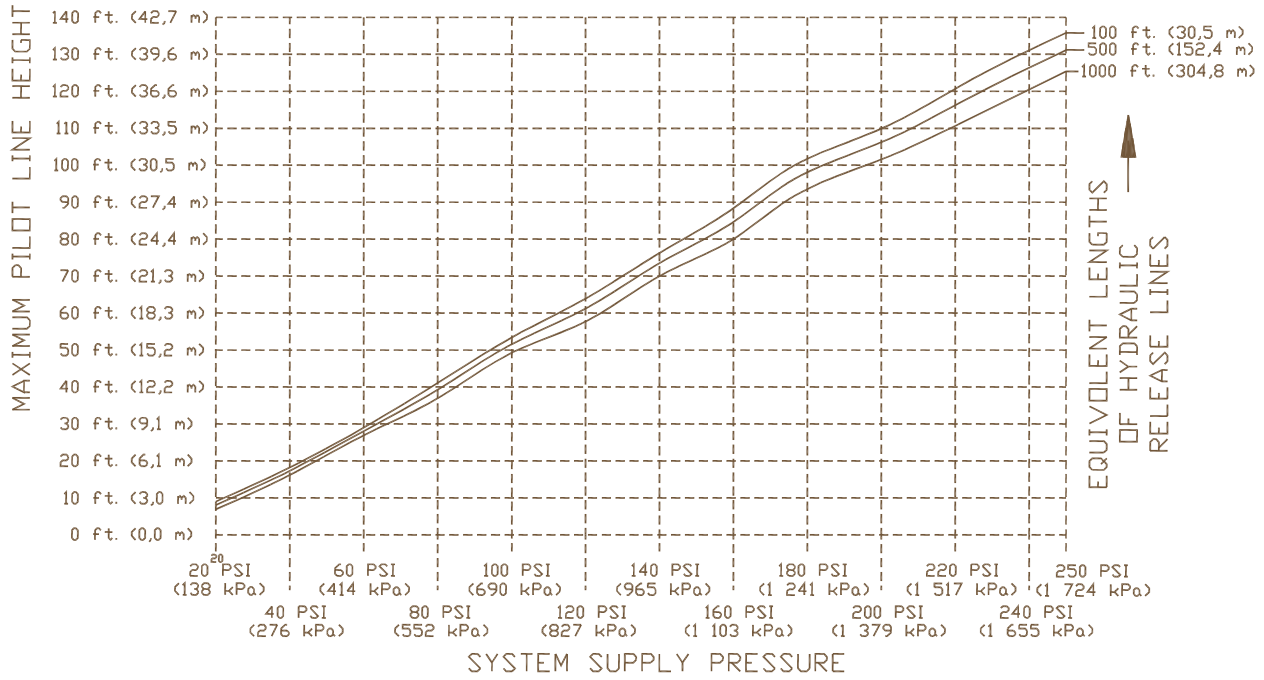

Figure 5 - 6” Valve

Replaces page 213a-l, dated June 24, 2011.
(Updated ABS Certificate number; formatting and layout upgrades)