



TECHNICAL DATA

WATER SPRAY/MIST EXTINGUISHING
SYSTEM FOR MACHINERY PROTECTION:
PARTICLE BOARD PRESSED

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

Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-945-4495 Email: techsvcs@vikingcorp.com

1. PRODUCT NAME

Viking Model EM Low Pressure Mist Nozzle System

- VK824, 125° Spray Pattern, K Factor Metric = 12.0,
US = 0.82, Viking P/N - 13633
- VK825, 95° Spray Pattern, K Factor Metric = 7.0,
US = 0.48, Viking P/N - 13872

2. DISTRIBUTOR

Viking S.A.

Zone Industrielle Haneboesch

L-4562 Differdange/Niedercorn

Luxemburg

Tel: +352 58 37 37-1

Fax: +352 58 37 36

3. INTRODUCTION

Approval:

 VdS Schadenverhütung G 4060046 and G 4080002

The requirements within this technical data sheet are based on experimental test data in accordance with the VdS test procedure for chipboard presses. If no requirements are specified in this technical data sheet the VdS guidelines for Water Spray Extinguishing Systems, Design and Installation (VdS 2109, edition 06/2002) shall be followed.

The technical data sheet of the Model EM Spray Nozzle shall be followed. In the case that the risk to be protected requires different criteria than described in this datasheet, the modified criteria shall be agreed upon by Viking and VdS, as accepting authority, and/or the Authority Having Jurisdiction.

The installation shall be carried out only by a qualified Viking-authorized installer. Only Viking components with the appropriate approval shall be used in this system.

4. FIELD OF APPLICATION

This data page describes the use of Viking Fine Water Spray Extinguishing Systems for the protection of particleboard presses where the following combustible substances are found:

1. flammable liquids with a flash point above 100 °C (212 °F) and/or
2. wood shavings / wood fiber materials as well as hazards of similar potential danger and fire load.

5. TECHNICAL DATA

5.1 Materials:

Body Casting: Brass UNS-C84400

Splitter: Brass UNS-C36000

Bushing: Brass UNS-C36000

Deflector: Phosphor Bronze UNS-C51000

Screw: Brass UNS-C65100

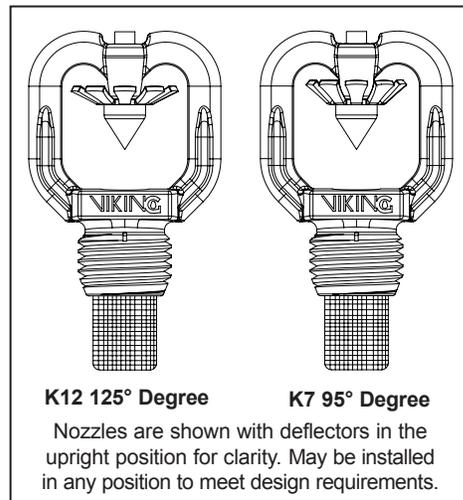
Screen: Stainless Steel UNS-S30400

Approved also in Nickel finish.

5.2 Quantities:

Presses with Nozzle Distance > 4.2 m (13.8 ft) not Staggered:

Nozzles with a K-Factor of 12 LPM/bar^{0.5} metric (0.82 U.S.) shall be operated in the press level at a minimum pressure of 6.5 bar (94 psi). (See Figure 5.)



WARNING: Cancer and Reproductive Harm-
www.P65Warnings.ca.gov



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Presses with Nozzle Distance < 4.2 m (13.8 ft) not Staggered:

Nozzles with K-Factor 12 LPM/bar^{0.5} metric (0.82 US), 125° spray angle and the nozzles at the press level are not staggered and are located at each level and opposite each other, then the pressure can be reduced to 4.0 bar (58 psi) for nozzle spacing not wider than 4.2 m (13.12 ft.). (See Figure 5.) The pressure should not exceed 10 bar (174 psi). For the application the resulting density of discharge is 5mm/min (.123 gpm/ft²) or for small fire loads 4 mm/min (.098 gpm/ft²).

Presses with Nozzle Distance < 4.2 m (13.8 ft) Staggered:

Nozzles with K-Factor 12 LPM/bar^{0.5} metric (0.82 US), 125° spray angle and the nozzles at the press level are staggered and are located at alternate levels and not opposite each other, then the pressure can be minimum 6.5 bar (94 psi). (See Figure 5.)

Presses with Nozzle Spacing < 3.7 m (12.14 ft) not Staggered:

Nozzles with K-Factor 7 LPM/bar^{0.5} metric (0.48 US), 95° Spray angle and the nozzles at the press level are not staggered and are opposite each other with maximum horizontal spacing of 1.0 m (3.28 ft) at the press level, then the minimum pressure can be applied at 4.6 bar (67 psi). (See Figure 5.)

The pressure should not exceed 12 bar (174 psi).

For the application the resulting density of discharge is 5mm/min (.123 gpm/ft²) or for small fire loads 4 mm/min (.098 gpm/ft²).

5.3 Areas of Protection and Water Supply

5.3.1 General

Large areas to be protected shall be divided into individual grouped areas of operation. The water supply shall be designed to supply the maximum number of systems within any 5 m (16.4 ft) radius, excluding any systems which are separated by a nonflammable fire resisting structure, which is cooled by the water of the extinguishing system.

5.3.2 Areas to protect as a particle board press

In the case of a particleboard press, the following five grouped areas of operation shall be planned for:

1. The upper heat duct over the full length.
2. The lower heat tunnel over the full length.
3. The press infeed up to the wipers.
4. The part of the press with hydraulic cylinders between the infeed and the runout.
5. The press runout.

In the case of long chipboard presses the press between the infeed and the runout may be subdivided into different areas of operation.

The water supply shall allow the simultaneous operation of all protected sections without the demand required by other extinguishing systems, such as sprinklers at the ceiling. Moreover, the water supply shall be calculated so that it is possible to operate the two grouped areas of operation with the highest water rate at the same time, in addition to the demand of the sprinkler system at the roof, allowing for a reduced area of operation of 300 m² (3229 ft²) in accordance with VdS CEA 4001.

5.3.3 Time of operation

The time of operation shall be 30 minutes.

6. ACCESSORIES

A. Model E Spray Nozzle: Available in Brass or Nickel finish (Refer to Viking Price List Schedule for part numbers)

B. Standard Wrench: Part Number 10896W/B (available since 2000)

C. Blow-off Plugs (Optional): 13161

D. Dust Cover with Retaining Cable & Support Escutcheon: Provided to protect the nozzle and deflector from accumulating dust, they are reusable. Part Number: 13632.

7. NOZZLE ARRANGEMENT

7.1 General

The spray nozzles shall be arranged in such a way that:

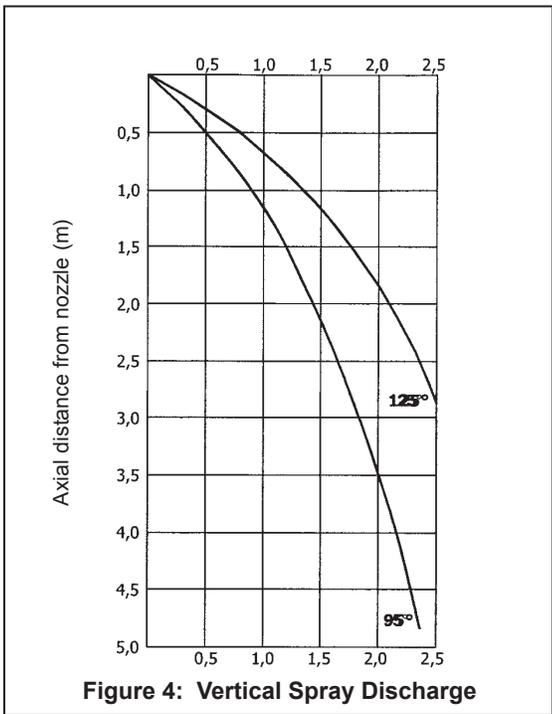
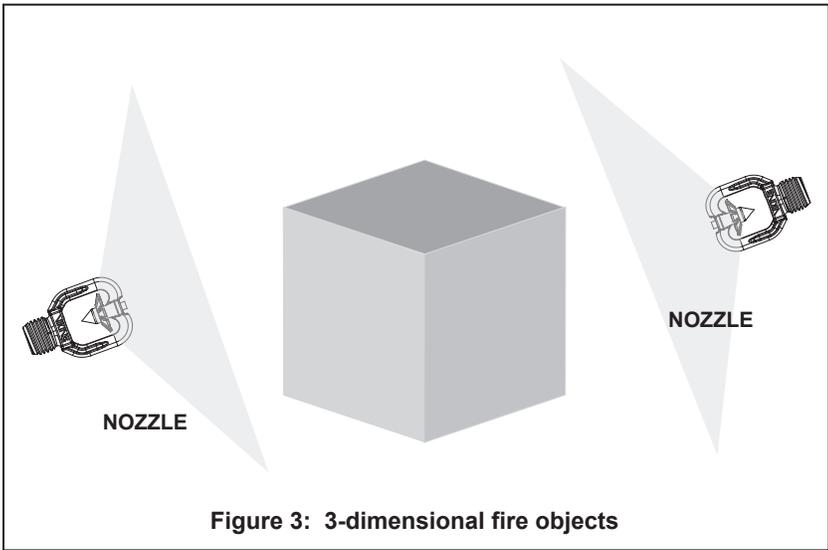
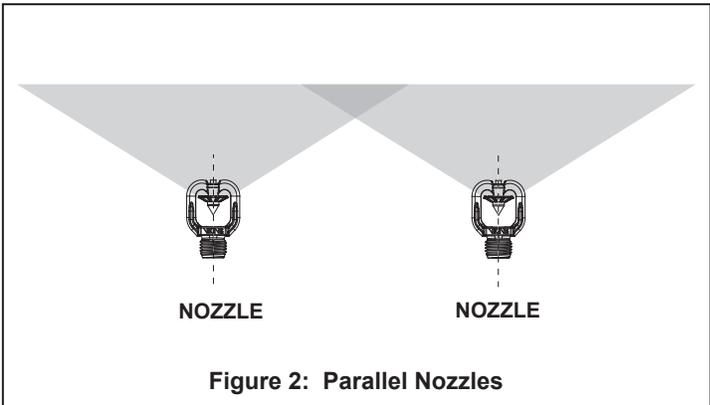
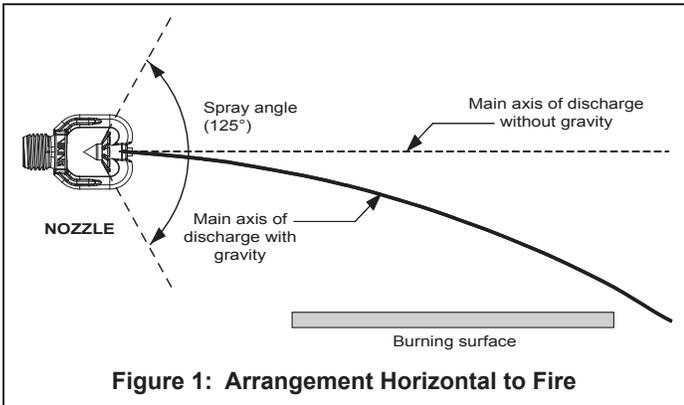
1. The fine water spray discharge from the nozzle covers the potential burning surface (see Figure 1).
2. The discharge of adjacent nozzles overlaps as far as possible in a common area to be protected (see Figure 2),
3. 3-dimensional fire objects are sprayed from as many sides as possible (see Figure 3),

If obstructions prevent the spraying of the fire load, additional spray nozzles shall be installed accordingly. If the spray nozzle

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is positioned vertically, take into account the effect of gravity on the spray angle (see Figure 4).

The distance between two horizontally adjacent nozzles should not exceed 1.8 m (5.9 ft) for K12.0, 125° angle spray or 1.0 m (3.28 ft) for K7.0, 95° spray angle nozzles. (See Figure 2.)



7.2 Press protection for wood industry

In the upper and lower heat ducts and presses with a width of more than 3 m (9.84 ft), design for an opposite staggered arrangement with a distance of 1.5 m (4.92 ft) between nozzles with K12, 125° angle spray at 4.0 bar (58 psi). The spacing should be 1 m (3.28 ft) with K7 95° spray angle at 4.6 bar (67 psi).

In the press infeed and runout zones, opposite nozzles shall be arranged preferably in three levels to wet potential ignition sources (hot belts, wipers) and existing fire loads (oil, press cake). Additional nozzles shall be directed to the infeed and runout of the press.

Plan for two levels of spray nozzles on each side in the middle part of the press where the hydraulic cylinders are lo-cated.

For frames wider than 1 m (3.28 ft), two nozzles per frame shall be used in each plane.

a) For presses with nozzle distance > 4.2 m (13.8 ft): the K12, 125° nozzles at 6.5 bar (94 psi) shall be arranged in the middle part of the press opposite each other.



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b) Presses with nozzle distance ≤ 4.2 m (13.8 ft): a staggered arrangement of one spray nozzle in the lower row and one nozzle opposite in the upper row is sufficient. Spray nozzles shall be directed at the press planes. The minimum pressure at the nozzle shall be 6.5 bar (94 psi).

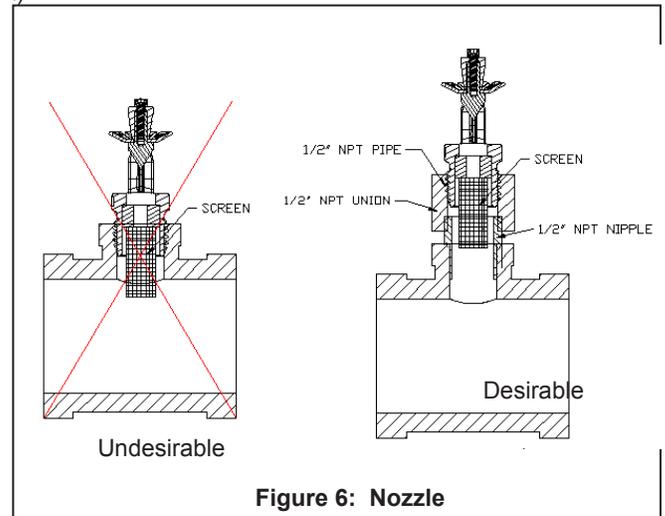
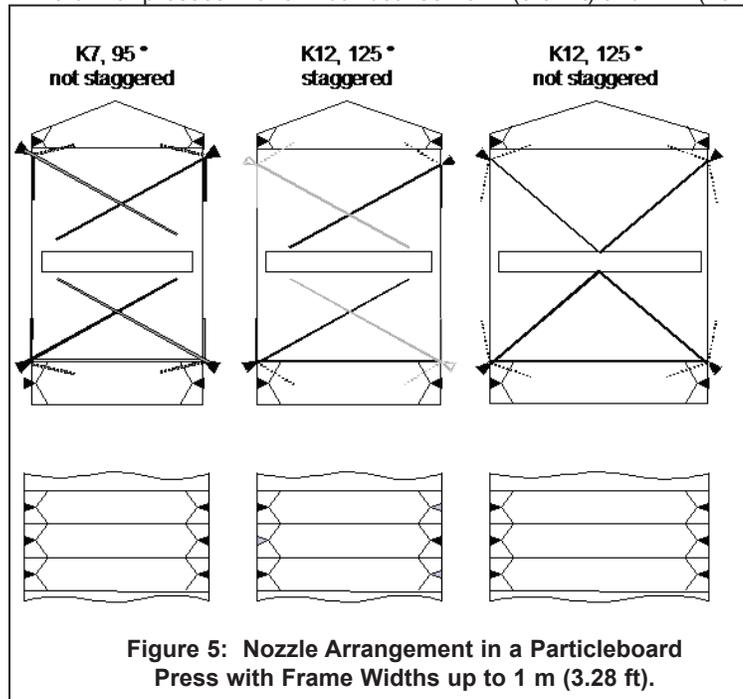
c) Presses with nozzle distance ≤ 4.2 m (13.8 ft.): if the K12, 125° nozzles applied at the press level are not staggered and are located at each level and opposite each other, then the pressure can be reduced to 4.0 bar (58 psi).

d) Presses with nozzle spacing < 3.7 m (12.14 ft): K7, 95° angle spray nozzles may be applied opposite each other at each level and minimum pressure of 4.6 bar (67 psi).

(see Figure 5.)

For presses with wider frames than 1.0 m (3.28 ft), two nozzles shall be positioned per nozzle level and for 4.2 m (13.8 ft) and wider nozzle spacing for presses, opposite nozzles on every level.

It is recommended that a higher level of protection be provided (see Figure 5: for presses with nozzle spacing > 4.2 m (13.8 ft) than for presses with a width between 3 m (9.84 ft) and 4 m (13.8 ft).



8. CONTROL AND RELEASE

Flame detectors are recommended. Detection must make it possible to individually control each protected area. Manual release of every single protected area must be possible.

In the case that only one area of operation is needed to cover the machinery the control of a the protected area can occur following the VdS guidelines for Water Spray Extinguishing Systems, VdS 2109, for "simple control":

- Control of two-pole, monostable, electromagnetic releasing devices by the working current principle (magnet normally un-operated)
- Operating voltage: 12/24 V DC \pm 15%
- Voltage tolerances shall be observed taking account of the power line (cable cross-section) leading to the electromagnet coil or, if necessary, according to the manufacturer's data.
- Trigger current DC, according to manufacturer's data
- Supervisory current ≤ 10 mA
- Control without retard
- Control with continuous impulse > 10 s $< \infty$ until release is interrupted or control device is reset.
 - Connection through primary lines (supervised)
 - Correct polarity shall be observed when activating the releasing device through connection / supervisory / protection modules (freewheel diodes or the like)



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- Electromagnetic compatibility and sufficient surge protection of the control device (in conformity with EMV and NSp guidelines) shall be guaranteed
- A power supply with sufficient power rating and capacity to supply energy safely to the control device with the aforementioned electrical features.

9. OTHER DESIGN CONSIDERATIONS

All ventilation systems should be powered closed on detection alarm or manual release if possible. All particleboard machinery in the protected area(s) should be stopped automatically on detection alarm or manual release. This applies particularly to any transport equipment conveying combustible material into or out of the protected area(s). It should be taken into consideration that some devices need time to shut down.

The system shall be designed so that the most unfavorable nozzle will deliver water 30 seconds after activation.

System control deluge valves shall be protected against mechanical damage and tampering by unauthorized persons. For the pipework, galvanized pipes or material providing better corrosion protection shall be used. The Viking EM nozzle includes a strainer and shall not protrude into the supply pipe (see figure 6).

An additional basket strainer shall be installed up stream of the deluge valve. Protective plugs or dust covers shall be used on each nozzle. (See Viking Data Page 132a and 33w).

Use the following deluge valves:

Model	Size	Equivalent Length	Type of Release
G4920055			
Model E-3	DN40 (1½")	5.0 m (16.4 ft)	electric
Model E-1	DN50 (2")	7.7 m (25.3 ft)	
	DN80 (3")	8.4 m (27.6 ft)	
	DN100 (4")	11.5 m (37.7 ft)	
	DN150 (6")	12.8 m (42.0 ft)	
G4920056			
Model H-3	DN40 (1½")	5.0 m (16.4 ft)	electric, resetable
Model H-1	DN80 (3")	8.4 m (27.6 ft)	
	DN100 (4")	11.5 m (37.7 ft)	
	DN150 (6")	12.8 m (42.0 ft)	

10. MAINTENANCE AND INSTALLATION INSTRUCTIONS

Using wrench P/N 10896W/B, mount the nozzles onto the installed piping. Never use a deflector to thread a nozzle into a fitting.

NOTE: THE OWNER IS RESPONSIBLE FOR MAINTAINING THE FIRE PROTECTION SYSTEM AND DEVICES IN PROPER OPERATING CONDITION. FOR MINIMUM REQUIREMENTS, REFER TO THE VDS DOCUMENT THAT DESCRIBES WATER SPRAY EXTINGUISHING SYSTEMS (VDS 2109). MOREOVER THE AUTHORITY HAVING JURISDICTION MAY HAVE ADDITIONAL MAINTENANCE, TESTING, AND INSPECTION REQUIREMENTS WHICH MUST BE FOLLOWED.

In addition to any maintenance stipulated in VdS 2109, the authorized installer should verify that

- the protective cap closes the nozzle orifice without being stuck or glued
- the filter is not contaminated after release
- the nozzle is not dirty or damaged.

11. AVAILABILITY

The products are available through a network of domestic and international distributors. See The Viking Corporation web site for <http://www.vikinggroupinc.com> for the closest distributor or contact The Viking Corporation.

12. GUARANTEE

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



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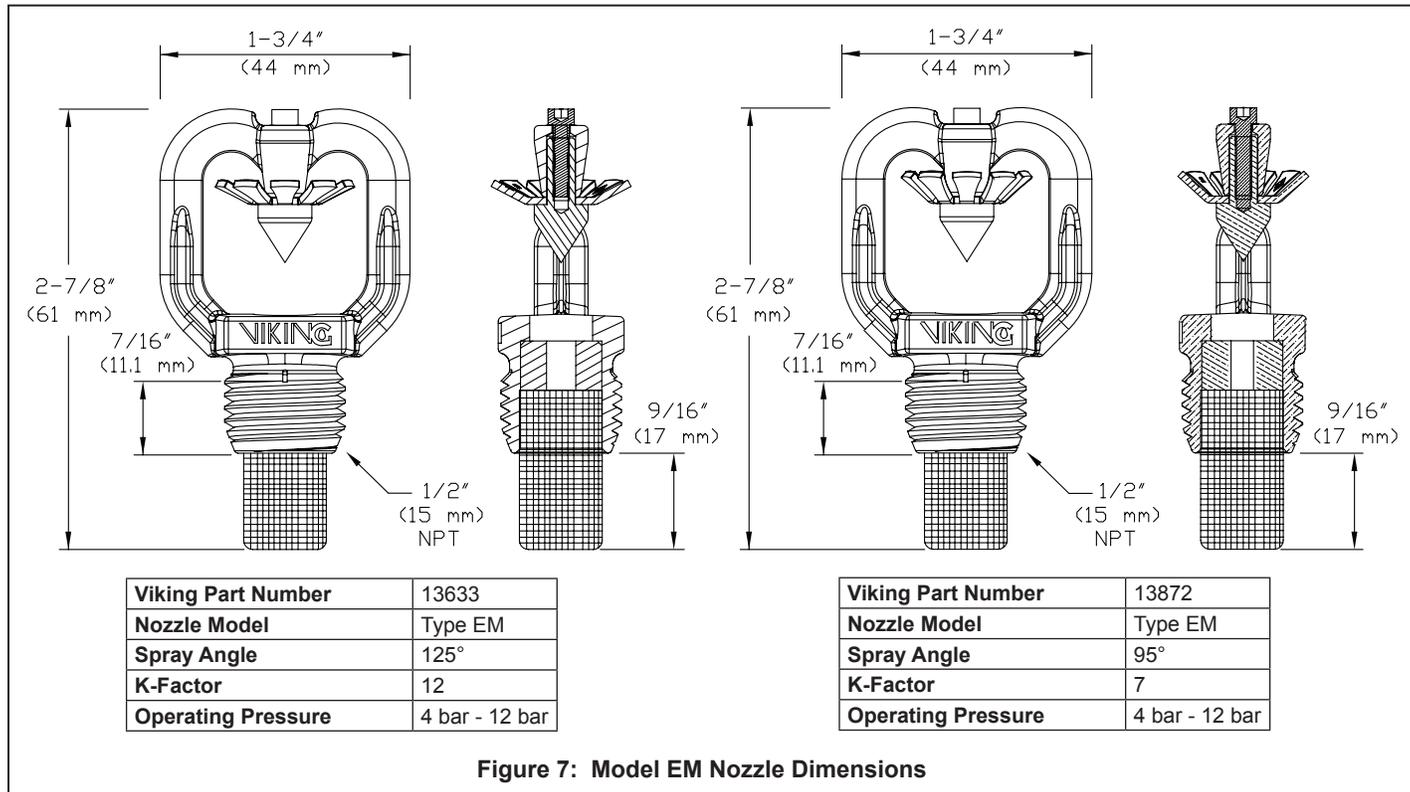


Figure 7: Model EM Nozzle Dimensions

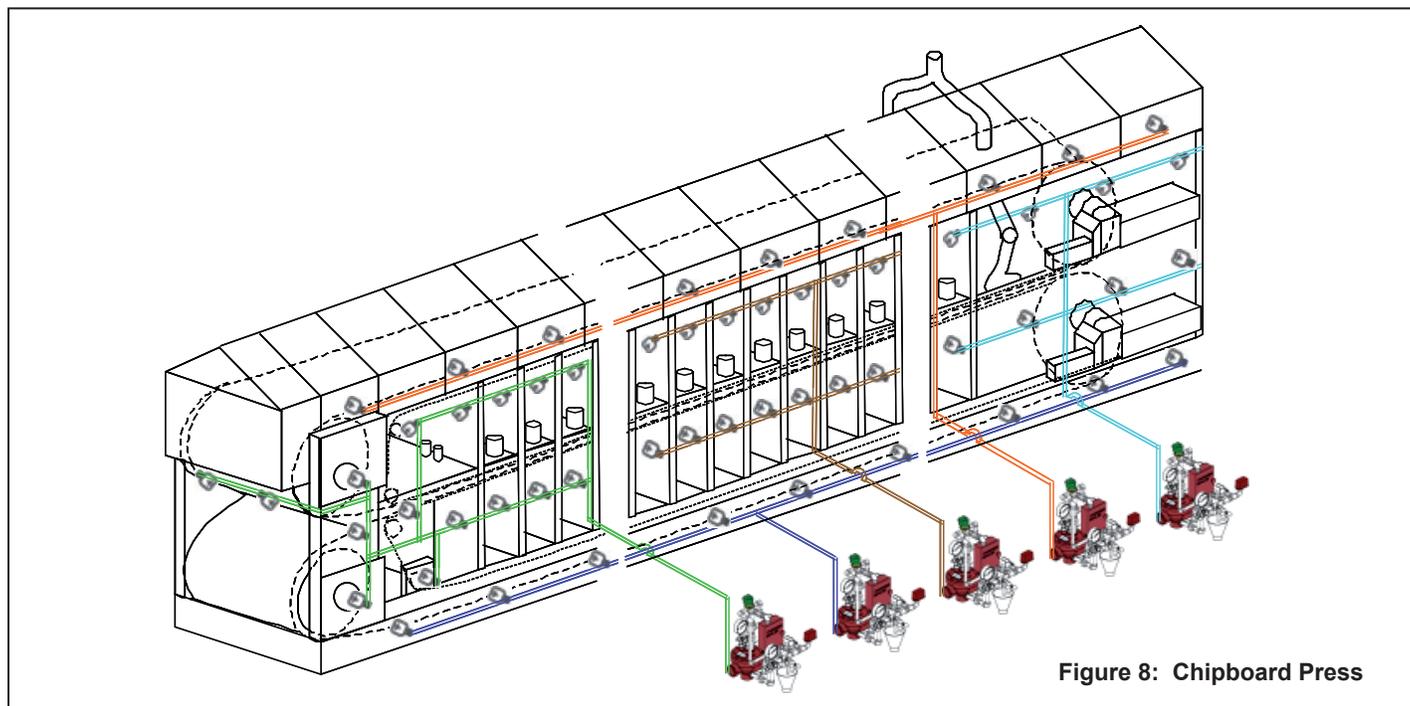


Figure 8: Chipboard Press



BULLETIN

CARE AND HANDLING OF SPRINKLERS

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SPRINKLERS ARE FRAGILE - HANDLE WITH CARE!

General Handling and Storage:

- Store sprinklers in a cool, dry place.
- Protect sprinklers during storage, transport, handling, and after installation.
- Use the original shipping containers. DO NOT place sprinklers loose in boxes, bins, or buckets.
- Keep sprinklers separated at all times. DO NOT allow metal parts to contact sprinkler operating elements.

For Pre-Assembled Drops:

- Protect sprinklers during handling and after installation.
- For recessed assemblies, use the protective sprinkler cap (Viking Part Number 10364).

Sprinklers with Protective Shields or Caps:

- DO NOT remove shields or caps until after sprinkler installation and there no longer is potential for mechanical damage to the sprinkler operating elements.
- **Sprinkler shields or caps MUST be removed BEFORE placing the system in service!**
- Remove the sprinkler shield by carefully pulling it apart where it is snapped together.
- Remove the cap by turning it slightly and pulling it off the sprinkler.

Sprinkler Installation:

- DO NOT use the sprinkler deflector or operating element to start or thread the sprinkler into a fitting.
- **Use only the designated sprinkler head wrench!** Refer to the current sprinkler technical data page to determine the correct wrench for the model of sprinkler used.
- DO NOT install sprinklers onto piping at the floor level.
- Install sprinklers after the piping is in place to prevent mechanical damage.
- DO NOT allow impacts such as hammer blows directly to sprinklers or to fittings, pipe, or couplings in close proximity to sprinklers. Sprinklers can be damaged from direct or indirect impacts.
- DO NOT attempt to remove drywall, paint, etc., from sprinklers.
- **Take care not to over-tighten the sprinkler and/or damage its operating parts!**

Maximum Torque:

- 1/2" NPT: 14 ft-lbs. (19.0 N-m)**
- 3/4" NPT: 20 ft-lbs. (27.1 N-m)**
- 1" NPT: 30 ft-lbs. (40.7 N-m)**



CORRECT
(Original container used)

INCORRECT
(Placed loose in box)



CORRECT
(Protected with caps)

INCORRECT
(Protective caps not used)



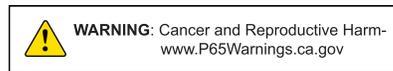
CORRECT
(Piping is in place at the ceiling)

INCORRECT
(Sprinkler at floor level)



CORRECT
(Special installation wrenches)

INCORRECT
(Designated wrench not used)



! WARNING

Any sprinkler with a loss of liquid from the glass bulb or damage to the fusible element should be destroyed. Never install sprinklers that have been dropped, damaged, or exposed to temperatures exceeding the maximum ambient temperature allowed. Sprinklers that have been painted in the field must be replaced per NFPA 13. Protect sprinklers from paint and paint overspray in accordance with the installation standards. Do not clean sprinklers with soap and water, ammonia, or any other cleaning fluid. Do not use adhesives or solvents on sprinklers or their operating elements.

Refer to the appropriate technical data page and NFPA standards for complete care, handling, installation, and maintenance instructions. For additional product and system information Viking data pages and installation instructions are available on the Viking Web site at www.vikinggroupinc.com.



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PROTECTIVE SPRINKLER SHIELDS AND CAPS

General Handling and Storage:

Many Viking sprinklers are available with a plastic protective cap or shield temporarily covering the operating elements. The snap-on shields and caps are factory installed and are intended to help protect the operating elements from mechanical damage during shipping, storage, and installation. NOTE: It is still necessary to follow the care and handling instructions on the appropriate sprinkler technical data sheets* when installing sprinklers with bulb shields or caps.

WHEN TO REMOVE THE SHIELDS AND CAPS:

NOTE: SHIELDS AND CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!

Remove the shield or cap from the sprinkler only after checking all of the following:

- The sprinkler has been installed*.
- The wall or ceiling finish work is completed where the sprinkler is installed and there no longer is a potential for mechanical damage to the sprinkler operating elements.

SHIELDS AND CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!



Figure 1: Sprinkler shield being removed from a pendent sprinkler.



Figure 2: Sprinkler cap being removed from a pendent sprinkler.



Figure 3: Sprinkler cap being removed from an upright sprinkler.

HOW TO REMOVE SHIELDS AND CAPS:

No tools are necessary to remove the shields or caps from sprinklers. DO NOT use any sharp objects to remove them! **Take care not to cause mechanical damage to sprinklers when removing the shields or caps.** When removing caps from fusible element sprinklers, use care to prevent dislodging ejector springs or damaging fusible elements. NOTE: Squeezing the sprinkler cap excessively could damage sprinkler fusible elements.

- To remove the shield, simply pull the ends of the shield apart where it is snapped together. Refer to Figure 1.
- To remove the cap, turn it slightly and pull it off the sprinkler. Refer to Figures 2 and 3.

NOTICE

Refer to the current sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used.

WARNING

Never install sprinklers that have been dropped, damaged, or exposed to temperatures in excess of the maximum ambient temperature allowed.

* Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.



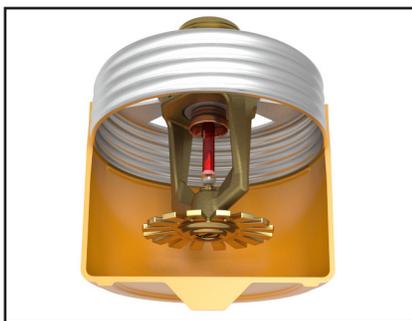
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CONCEALED COVER ASSEMBLIES ARE FRAGILE!
TO ASSURE SATISFACTORY PERFORMANCE OF THE PRODUCT, HANDLE WITH CARE.



Concealed Sprinkler and Adapter
 Assembly with Protective Cap

Concealed Sprinkler and Adapter
 Assembly (Protective Cap Removed)



Cover Plate Assembly
 (Pendent Cover 12381 shown)



GENERAL HANDLING AND STORAGE INSTRUCTIONS:

- Do not store in temperatures exceeding 100 °F (38 °C). Avoid direct sunlight and confined areas subject to heat.
- Protect sprinklers and cover assemblies during storage, transport, handling, and after installation.
 - Use original shipping containers.
 - Do not place sprinklers or cover assemblies loose in boxes, bins, or buckets.
- Keep the sprinkler bodies covered with the protective sprinkler cap any time the sprinklers are shipped or handled, during testing of the system, and while ceiling finish work is being completed.
- Use only the designated Viking recessed sprinkler wrench (refer to the appropriate sprinkler data page) to install these sprinklers. **NOTE:** The protective cap is temporarily removed during installation and then placed back on the sprinkler for protection until finish work is completed.
- Do not over-tighten the sprinklers into fittings during installation.
- Do not use the sprinkler deflector to start or thread the sprinklers into fittings during installation.
- Do not attempt to remove drywall, paint, etc., from the sprinklers.
- Remove the plastic protective cap from the sprinkler before attaching the cover plate assembly. **PROTECTIVE CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!**

Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.



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USE THE FOLLOWING PRECAUTIONS WHEN HANDLING WAX-COATED SPRINKLERS

Many of Viking's sprinklers are available with factory-applied wax coating for corrosion resistance. These sprinklers MUST receive appropriate care and handling to avoid damaging the wax coating and to assure satisfactory performance of the product.

General Handling and Storage of Wax-Coated Sprinklers:

- Store the sprinklers in a cool, dry place (in temperatures below the maximum ambient temperature allowed for the sprinkler temperature rating. Refer to Table 1 below.)
- Store containers of wax-coated sprinklers separate from other sprinklers.
- Protect the sprinklers during storage, transport, handling, and after installation.
- Use original shipping containers.
- Do not place sprinklers in loose boxes, bins, or buckets.

Installation of Wax-Coated Sprinklers:

Use only the special sprinkler head wrench designed for installing wax-coated Viking sprinklers (any other wrench may damage the unit).

- Take care not to crack the wax coating on the units.
- For touching up the wax coating after installation, wax is available from Viking in bar form. Refer to Table 1 below. The coating MUST be repaired after sprinkler installation to protect the corrosion-resistant properties of the sprinkler.
- Use care when locating sprinklers near fixtures that can generate heat. Do not install sprinklers where they would be exposed to temperatures exceeding the maximum recommended ambient temperature for the temperature rating used.
- Inspect the coated sprinklers frequently soon after installation to verify the integrity of the corrosion resistant coating. Thereafter, inspect representative samples of the coated sprinklers in accordance with NFPA 25. Close up visual inspections are necessary to determine whether the sprinklers are being affected by corrosive conditions.

TABLE 1

Sprinkler Temperature Rating (Fusing Point)	Wax Part Number	Wax Melting Point	Maximum Ambient Ceiling Temperature ¹	Wax Color
155 °F (68 °C) / 165 °F (74 °C)	02568A	148 °F (64 °C)	100 °F (38 °C)	Light Brown
175 °F (79 °C)	04146A	161 °F (71 °C)	150 °F (65 °C)	Brown
200 °F (93 °C)	04146A	161 °F (71 °C)	150 °F (65 °C)	Brown
220 °F (104 °C)	02569A	170 °F (76 °C)	150 °F (65 °C)	Dark Brown
286 °F (141 °C)	02569A	170 °F (76 °C)	150 °F (65 °C)	Dark Brown

¹ Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.



Never install sprinklers that have been dropped, damaged, or exposed to temperatures in excess of the maximum ambient temperature allowed.

Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.

**BULLETIN****REGULATORY AND HEALTH
WARNINGS**

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Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

1. DESCRIPTION

Regulatory and Health Warnings applying to materials used in the manufacture and construction of fire protection products are provided herein as they relate to legally mandated jurisdictional regions.

⚠ WARNING**STATE OF CALIFORNIA, USA**

Installing or servicing fire protection products such as sprinklers, valves, piping etc. can expose you to chemicals including, but not limited to, lead, nickel, butadiene, titanium dioxide, chromium, carbon black, and acrylonitrile which are known to the State of California to cause cancer or birth defects or other reproductive harm.

For more information, go to www.P65Warnings.ca.gov

2. WARRANTY TERMS AND CONDITIONS

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