



TECHNICAL DATA

**COIN® QUICK
RESPONSE UPRIGHT
SPRINKLER VK950
(SPECIFIC APPLICATION)**

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
 Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
 Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

1. DESCRIPTION

Viking QR COIN® Sprinklers are quick response specific application sprinklers for combustible interstitial (concealed) spaces (i.e., between floors, as well as low pitch attics that meet the criteria shown in the figures in this data page). These upright sprinklers are designed for use in specific light hazard combustible, as well as non-combustible, concealed spaces requiring sprinkler protection. The orifice design of the Viking QR COIN® Sprinkler, with a nominal K-factor of 5.6 (80 metric*), allows efficient use of available water supplies for hydraulically designed fire protection systems. The glass bulb operating element and special deflector combine speed of operation and area of coverage to meet the crucial fire protection requirement for shallow space combustible concealed spaces. The Electroless Nickel PTFE (ENT) coating has been investigated for installation in corrosive atmospheres and is listed/approved as corrosion resistant as indicated in the Approval Charts.

FEATURES

In some cases COIN® Sprinklers can allow the use of CPVC piping within the concealed spaces of applications requiring sprinkler protection in open truss construction of both wood and steel trusses (see Figure 3) and solid wood or composite wood joist with upper deck filled with non-combustible insulation (see Figure 4).
 COIN® Sprinklers can also be installed with steel pipe in protected areas constructed of solid wood joists (see Figure 5), and solid wood or composite wood joist with upper deck filled with non-combustible insulation (see Figure 6), and in unobstructed open truss construction of both wood and steel trusses (see Figure 7) as well as obstructed wood truss construction (see Figure 8).
 When using steel pipe, COIN® Sprinklers can be applied as a dry system using air or gas as a supervisory medium (Figures 5–8).



Coin® Sprinkler	
VK950	5.6K (80 metric)

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV



Refer to the Approval Chart and Design Criteria in this technical data sheet for cULus Listing requirements that must be followed.

The COIN® Sprinkler has been tested to address the proper application density for shallow concealed combustible space fire protection when installed in accordance with this technical data page. The COIN® Sprinkler must be installed in the upright position as specified in the appropriate application described in Figures 3–8. The clearance from the sprinkler deflector to the roof is critical to operation of the sprinkler (refer to Figures 3–8). The clearances from pipe to lower ceiling for CPVC pipe is critical for protection of CPVC pipe. For open truss and joist spaces, the maximum detection area is important for proper installation. Draft curtains or heat collection baffles or solid walls are required using wood or other product that will not allow heat to escape. The maximum detection space shall be limited to 1000 ft² (93 m²). The draft curtain is required to protrude down from the top deck surface as specified herein.

3. TECHNICAL DATA

Specifications:

- Minimum Operating Pressure: Refer to Design Criteria in this technical data sheet.
- Rated to 175 psi (12 bar) water working pressure
- Factory tested hydrostatically to 500 psi (34.5 bar)
- Thread size: 1/2" (15 mm) NPT
- Nominal K-Factor: 5.6 U.S. (80 metric*)

* Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

- Glass-bulb fluid temperature rated to -65 °F (-55 °C)
- Overall Length: 2-1/4" (57 mm)

Material Standards:

- Frame Casting: Brass UNS-C84400 or QM Brass
- Deflector: Phosphor Bronze UNS-C51000
- Bulb: Glass, nominal 3 mm diameter



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Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with Teflon Tape

Screw: Brass UNS-C36000

Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400

Ordering Information: (Also refer to the current Viking price list.)

Order the QR COIN® Sprinkler by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number 20757.

Available Finishes And Temperature Ratings:

Finish Suffixes: Brass = A, ENT = JN

Temperature Suffixes: 200 °F (93 °C) = E

For example, sprinkler VK950 with a Brass finish and a 200 °F (93 °C) temperature rating = Part No. 20757AE

Accessories: (Also refer to the Viking Website)

Sprinkler Wrench:

Standard Wrench: Part No. 21475M/B (available since 2017).

Sprinkler Cabinets:

A. Six-head capacity: Part No. 01724A (available since 1971)

B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During a fire condition, the heat sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the deflector, forming a uniform spray pattern to extinguish or control the fire, and protect the piping in the interstitial space.

6. INSPECTIONS, TESTS AND MAINTENANCE

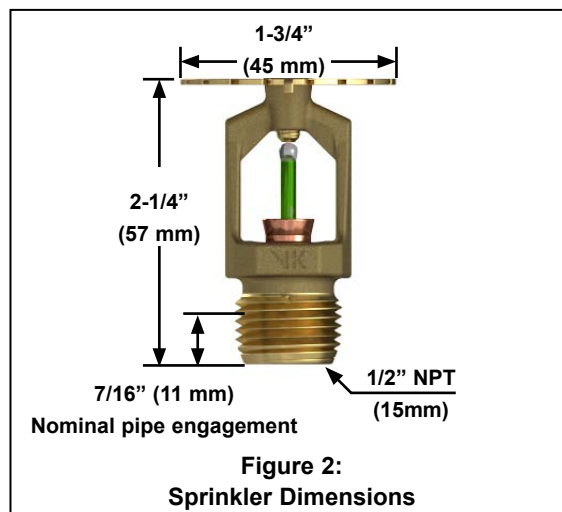
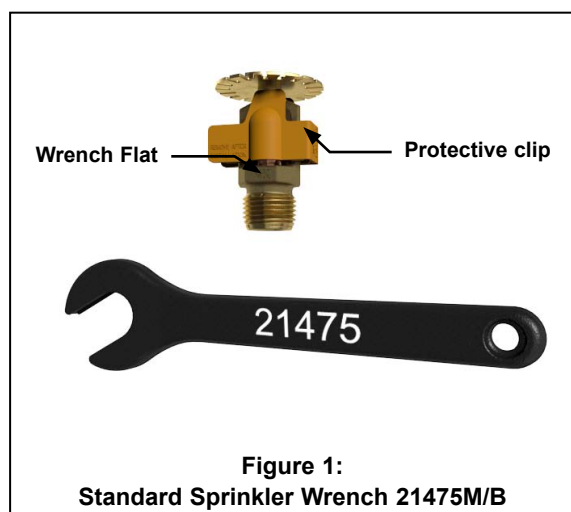
Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

The Viking QR COIN® Sprinkler is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

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





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TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating ¹	Maximum Ambient Ceiling Temperature ²	Bulb Color
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green

Sprinkler Finish: Brass, ENT³

Footnotes

¹ The sprinkler temperature rating is stamped on the deflector.

² 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.

³ The corrosion resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Charts. These tests cannot and do not represent all the possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the ENT coating is applied to all exposed exterior surfaces, including the waterway. For ENT coated sprinklers, the Belleville spring is exposed.

Approval Chart

COIN® Specific Application QR Upright Sprinkler VK950
For Light Hazard Occupancies Only

KEY	
Temperature	→
Finish	↓
Escutcheon (if applicable)	←

Part Number ¹	SIN	Maximum Pressure	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals ³ (Refer also to Design Criteria.)	
			NPT	BSP	U.S.	metric ²	Inches	mm	cULus ⁴	
20757	VK950	175 psi	1/2"	15 mm	5.6	80	2-1/4	57	A1	
Approved Temperature Rating A - 200 °F (93 °C)							Approved Finish 1 - Brass, ENT ⁶			

Footnotes

¹ Also refer to Viking's current price schedule.

² Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

³ This table shows the listings and approvals available at the time of printing. Other approvals may be in process.

⁴ Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.

⁵ Meets New York City requirements, effective July 1, 2008.

⁶ cULus Listed as corrosion resistant.



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DESIGN CRITERIA - CPVC PIPE (See Figures 3 and 4)

(Also refer to the Approval Chart on page 3.)

The Viking COIN® Sprinkler MUST be installed in the upright position.

APPLICATION

For installation in horizontal interstitial concealed spaces constructed of engineered open wood trusses, open bar joist, and non-combustible insulation completely filling the upper joist for solid or composite wood joist construction having roof pitch of up to 2/12.

NOTE: In order to be considered “non-combustible insulation filled solid wood or composite wood joist construction”, the insulation (including insulation provided with a combustible vapor barrier), must completely fill the pockets between the joists to the bottom of the joists, and the insulation must be secured in place with metal wire netting. The metal wire netting is intended to hold the insulation in place should the insulation become wetted by the operation of the COIN® Sprinklers in the event of a fire.

A. Concealed Space Limitations

The concealed space is not limited in size:

- Draft curtains (heat collection baffle) or full height walls must be provided to limit the maximum area in order to confine heat of localized detection area to 1000 ft² (93 m²).
- The draft curtain must be at least 1/3 the depth of the concealed space or 8” (200 mm), whichever is greater, for open truss construction, open bar joist, and non-combustible insulation filled solid or composite wood joist construction.
- The draft curtain must be constructed of material that will not allow heat to escape through or above it; this may be ¼” (6.4 mm) thick plywood.

B. Concealed Space Height

Open Wood Truss and Open Steel Joist Construction (Figure 3):

- Maximum height of the space: 60” (1524 mm).
- Minimum height: 6” (152 mm)
- Maximum roof pitch: 2/12 (9°)

Where applied to pitch roof and flat ceiling, maintain specified clearances from sprinkler deflector to truss and maximum height of pipe run to ceiling or non-combustible ceiling insulation in all locations. **NOTE:** The sprinkler deflector shall be installed parallel with the roof plane.

Solid wood or composite wood joist with non-combustible filled insulation only (Figure 4):

- Maximum depth of concealed space is 60” (1524 mm) from bottom of upper deck joist to top of ceiling joist.
- Minimum depth is 6” (152 mm) from bottom of upper deck joist to top of ceiling joist or non-combustible ceiling insulation.

C. System Type

- Light Hazard, Wet Pipe System

D. Minimum Density

- 0.10 gpm/ft² (4.1 mm/min).

E. Spacing of COIN® Sprinklers

- Minimum Spacing: 6'-0" (1.8 m)
- Maximum Spacing: 16'-0" (4.9 m)

NOTE: Minimum spacing does not include additional sprinklers required for obstructions for use of CPVC pipe that includes offsets.

F. Maximum Area of Coverage

- 256 ft² (23.8 m²)

G. Minimum Operating Pressure

- 7.0 PSI (0.48 bar)

(continues on page 5.)



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DESIGN CRITERIA - CPVC PIPE (See Figures 3 and 4) (Also refer to the Approval Chart)

(continued from page 4.)

I. Remote Area

- 1,000 ft² (93 m²)

NOTE: This area does not include additional sprinklers for protection of CPVC pipe over obstructions.

J. UL Listed CPVC Pipe for use with COIN™ Sprinklers

The Viking COIN® Sprinkler is UL Listed for use with CPVC pipe products listed for use in concealed spaces with sprinklers**.

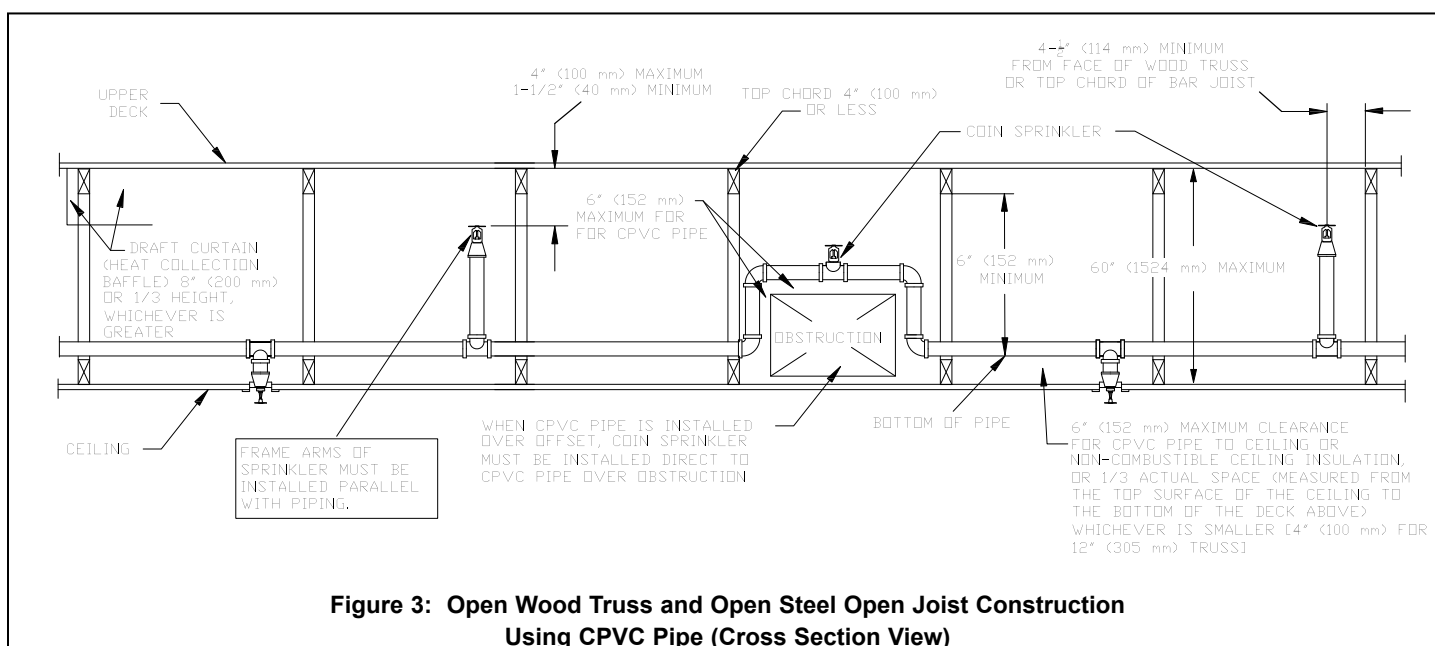
**Currently listed products are manufactured under the BlazeMaster®, FireLock®, and FlameGuard® trade names.

In order to use CPVC products, the bottom of the horizontal run must be no greater than 6" (152 mm) or 1/3 of the total space, whichever is smaller, above the ceiling or non-combustible insulation or 1/3 the depth of the space measured from the top surface of the ceiling to the bottom of the deck above. The CPVC pipe can supply the COIN® Sprinklers and the ceiling sprinklers below. Use all guidelines and installation instructions as specified by the CPVC pipe manufacturers unless specified differently in this data sheet. When using 1" (DN25) pipe or larger, a hanger must be located at the truss nearest the sprig for restraint. If using 3/4" (DN20), all sprigs over 12" (305 mm) must include lateral bracing.

For use of listed CPVC pipe products in concealed spaces using the COIN® Sprinkler, a minimum lateral distance of 18" (450 mm) must be maintained between the CPVC pipe and the heat sources (e.g. HVAC heat pump units, fan motors, and heat lamps, etc.)

Where CPVC pipe must be installed above the maximum distance of 6" (152 mm) or 1/3 of the total space, whichever is smaller, above the ceiling or non-combustible insulation when piping around obstructions, additional COIN® Sprinklers must be installed as shown in Figures 3 and 4 in order to protect the CPVC product.

The vertical sprinkler deflector clearance to the bottom of the roof deck is 1-1/2" to 4" (40 to 100 mm) for open truss construction wood or steel. For solid wood or composite wood joist construction with solid fill non-combustible insulation, the clearance from the sprinkler deflector to the bottom of the joist is 1-1/2" to 4" (40 mm to 100 mm).





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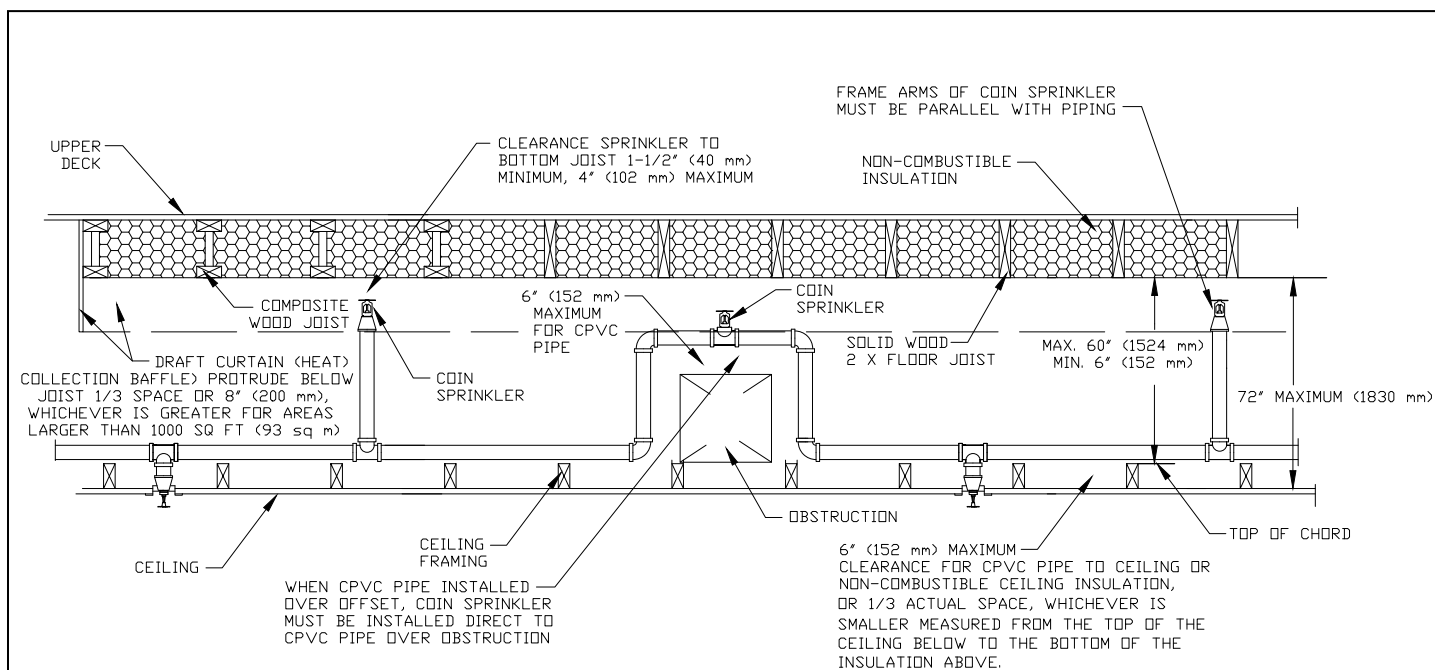


Figure 4: Solid Wood or Composite Wood Joist Construction with Non-Combustible Insulation Filling Upper Deck Using CPVC Pipe (Cross Section View)

DESIGN CRITERIA - STEEL PIPE (See Figures 5-8)

(Also refer to the Approval Chart on page 3)

The Viking COIN® Sprinkler MUST be installed in the upright position.

APPLICATION

For installation in horizontal concealed spaces of solid wood joist construction with a roof pitch of up to 2/12 maximum. The upper joist is constructed of solid wood or composite wood with a maximum depth of 12" (305 mm) and 16" (400 mm) on center minimum spacing. Also, steel pipe may be applied in truss construction and solid filled non-combustible insulation in upper deck and wood or composite joist construction similar to that shown in Figures 3 & 4 with the exception of extra sprinklers are not required over obstructions. Also, there is no minimum clearance for supply pipe to upper joists.

With the COIN® Sprinkler applied using steel pipe, the system may be wet, dry, or preaction type for wood truss or steel construction; solid wood or composite with non-combustible solid fill insulation (see Paragraph J on page 7).

NOTE: In order to be considered "non-combustible insulation filled solid wood or composite wood joist construction", the insulation (including insulation provided with a combustible vapor barrier), must completely fill the pockets between the joists to the bottom of the joists, and the insulation must be secured in place with metal wire netting. The metal wire netting is intended to hold the insulation in place should the insulation become wetted by the operation of the COIN® Sprinklers in the event of a fire.

(continues on page 7.)



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DESIGN CRITERIA - STEEL PIPE (See Figures 5–8)

(Also refer to the Approval Chart on page 3)

(continued from page 6)

A. Concealed Space Limitations

The total concealed space is not limited, but blocking between joists and upper deck must be constructed of material that will not allow heat to escape through or above the blocking. The blocking must be constructed to the full depth of the upper joist, and must be constructed using a non-combustible material or a material that is the same as that of the joist construction. A maximum channel space for blocking is 32' (9.75 m) intervals.

Also, solid wall construction or draft curtains (heat collection baffles) must protrude below the joist a minimum of 6" (152 mm) or 1/3 the space, whichever is greatest, and run laterally with the joist spaced at 31' (9.4 m) width maximum to limit the heat detection space to a maximum of 1,000 ft² (93 m²). The draft curtain may be constructed of 1/4" (6.4 mm) thick plywood to prevent heat from escaping beyond.

NOTE: When non-combustible solid filled insulation is used, the wood blocking and draft curtains are not required.

B. Concealed Space Height

Solid Wood or Composite Wood Joist Construction (See Figures 5 and 6):

- Maximum depth or height of concealed space: 60" (1524 mm) from bottom of upper deck joist to top of ceiling joist.
- Maximum space from bottom of upper deck to ceiling surface (bottom of joist): 84" (2134 mm). See Figure 5.
- Minimum depth or height of concealed space: 6" (152 mm) from bottom of upper deck joist to top of ceiling frame joist.

Open Wood Truss or Open Steel Bar Joist (See Figure 7):

- Maximum height from inside ceiling to inside deck of concealed space: 60" (1524 mm).
- Minimum height from bottom of upper chords to top of lower chords: 6" (152 mm)

Obstructed Wood Truss (See Figure 8):

- Maximum depth of concealed space: 84" (2134 mm) from bottom of upper deck to top of ceiling joist.
- Minimum depth of concealed space: 6" (152 mm) from bottom of upper chord to top of lower chord.

C. System Type

- Light hazard, wet pipe system or dry pipe system supervised with air or gas when using steel pipe only.

D. Minimum Density

- 0.10 gpm/ft². (4.1 mm/min).

E. Spacing of COIN® Sprinklers

- Minimum Space Between Sprinklers: 6'-0" (1.8 m)
- Maximum Space Between Sprinklers: 16'-0" (4.9 m)

F. Maximum Area of Coverage

- 256ft² (23.8 m²)

G. Minimum Operating Pressure

- 7.0 PSI (0.48 bar)

H. COIN® Sprinkler Deflector Position

The COIN® Sprinkler shall be installed in the upright position. The frame arms must be installed parallel with the pipe.

- 1-1/2" to 4" (40 - 100 mm) below upper deck for open wood truss construction or concealed spaces of non-combustible open bar joist construction.
- 1-1/2" to 2" (40 - 50 mm) below solid wood joist or top chord of obstructed wood truss construction. See Figures 5–8.
- 1-1/2" to 4" (40 - 100 mm) below non-combustible insulation-filled solid wood joists or composite wood joists. See Figure 6.

I. Remote Area

The remote area for open wood truss construction or open bar joist construction (Figure 7) or solid wood joist construction (Figure 5) is 1000 ft² (93 m²) for wet pipe systems and dry pipe systems.

The remote area for non-combustible insulation filled solid wood joist or wood composite joist construction (Figure 6) is to be calculated per the requirements of NFPA 13.

J. Piping System

Steel pipe installed in accordance with NFPA 13 standards may be applied. The steel pipe may be hung from the upper joist or truss using proper supports. The sprinkler deflector must be positioned as indicated in paragraph H above. Extra sprinklers are not required for protection of pipe when offsetting for obstructions. Ceiling sprinklers below the concealed space may be fed from the same piping as the COIN® Sprinklers.

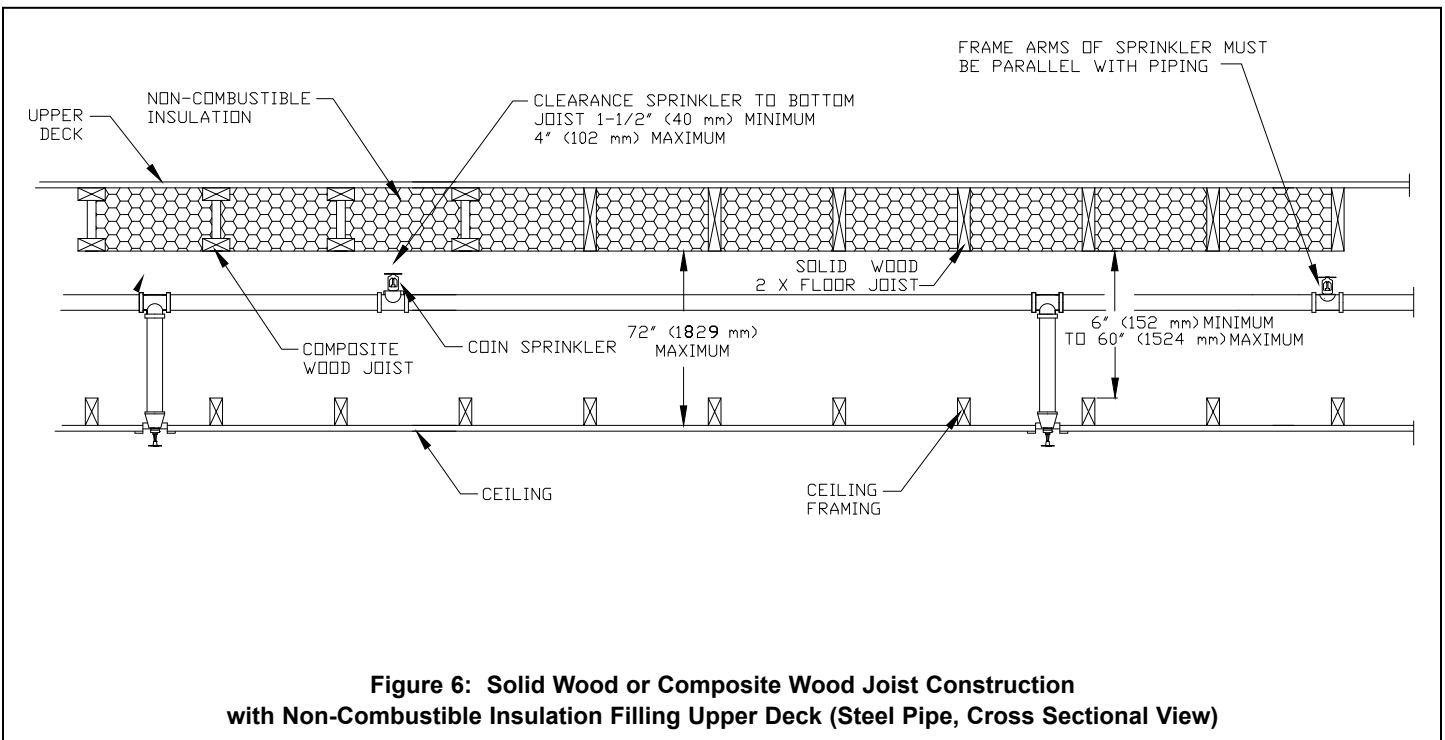
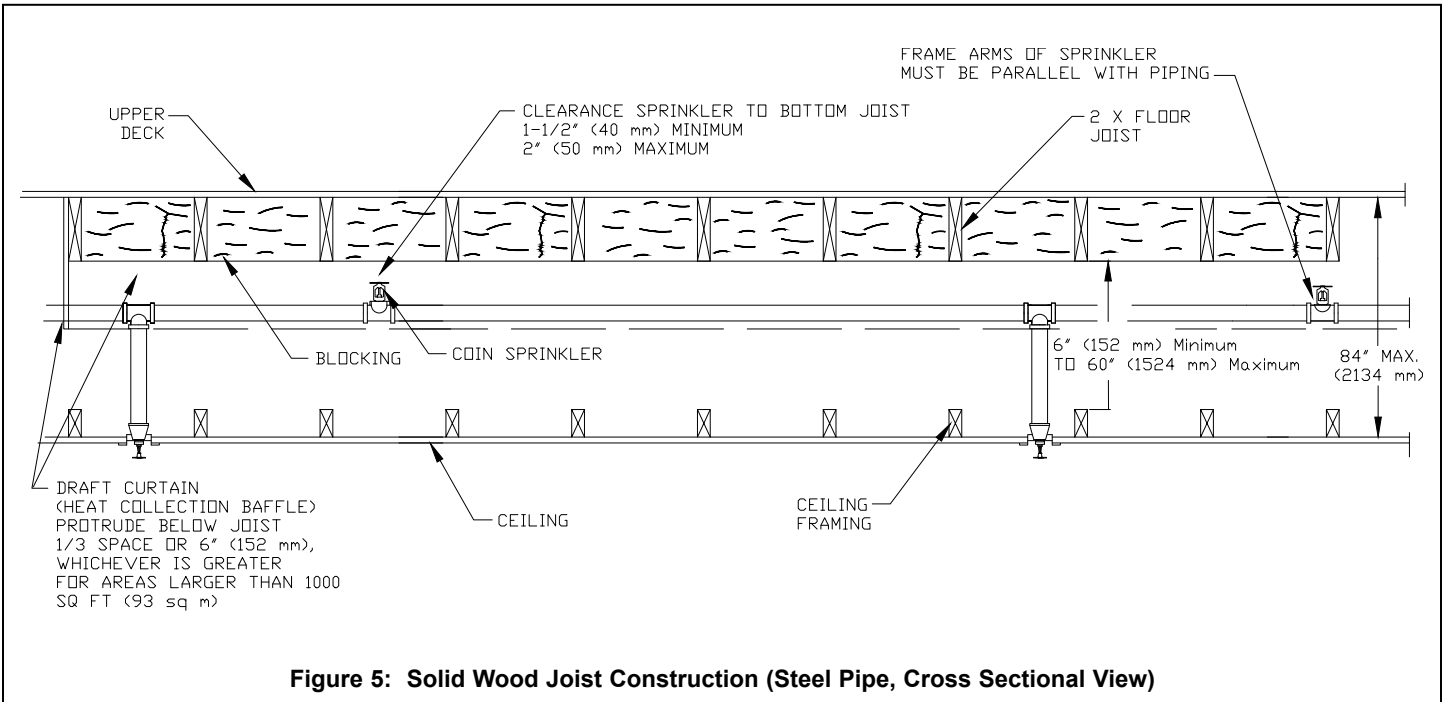
IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Bulletin Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.



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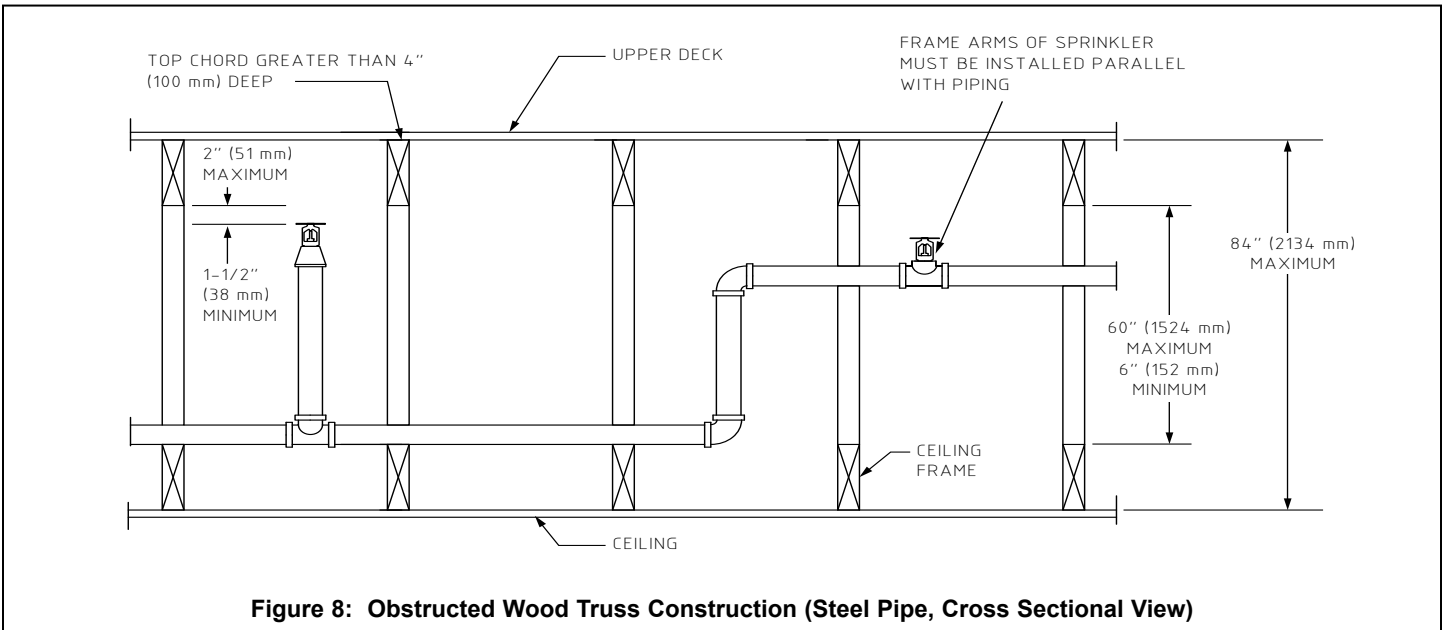
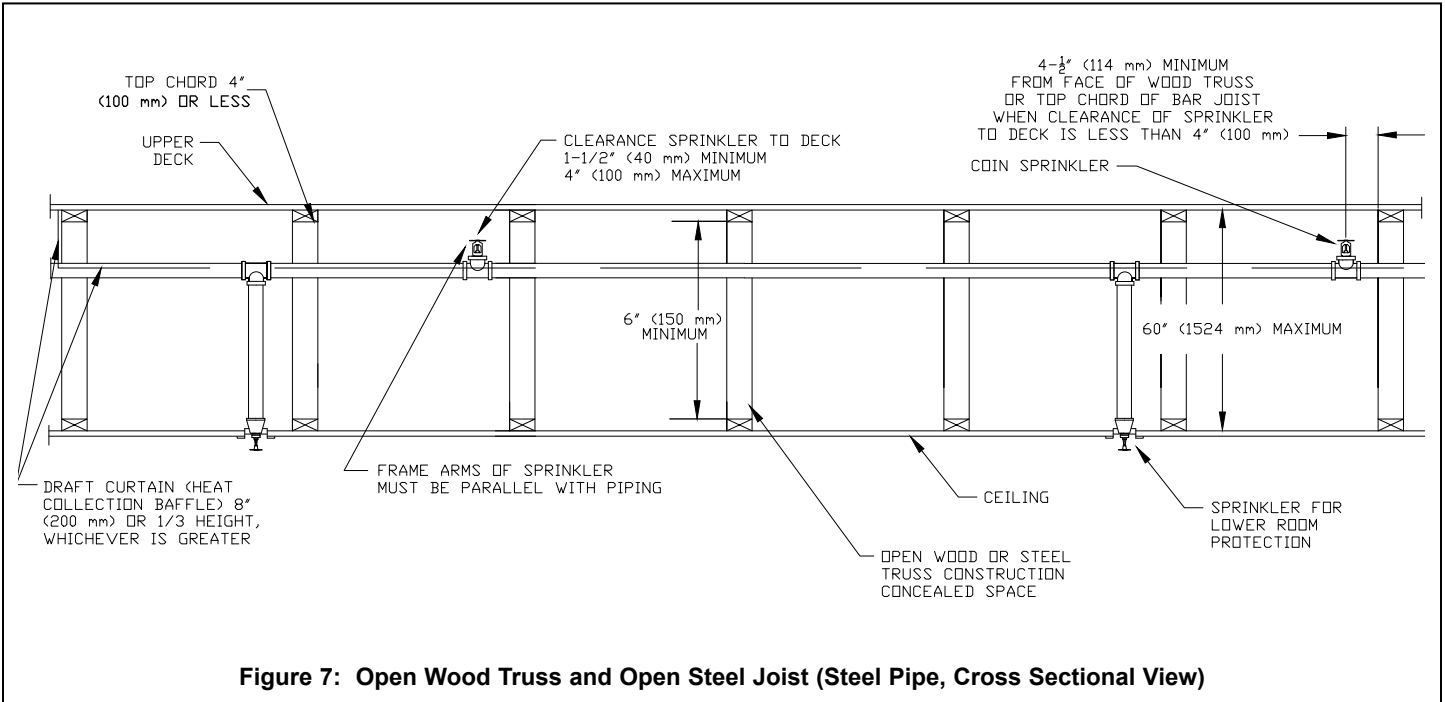




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OBSTRUCTION CRITERIA - CPVC and STEEL PIPE

APPLIES TO BOTH CPVC AND STEEL PIPE (Also refer to the Approval Chart)

Obstructions

- All obstruction criteria per NFPA 13 shall apply unless specified differently in this data sheet. See illustrations below.

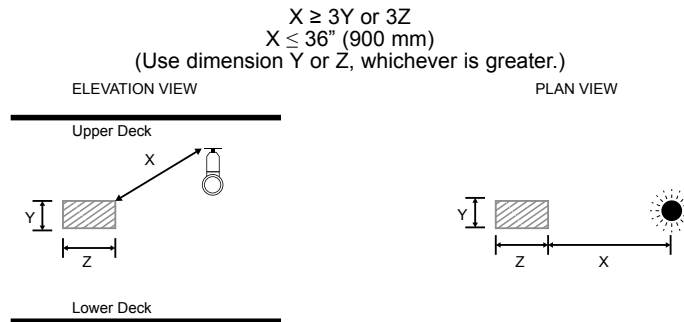
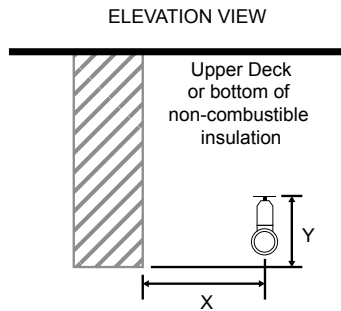


Figure 9A: NFPA 13 Obstruction Criteria



Distance from Sprinkler to Side of Obstruction (X)		Maximum Allowable Distance of Deflector Above Bottom of Obstruction (Y)	
< 1'-0"	<300 mm	0"	0 mm
1'-0" to <1'-6"	300 mm to <450 mm	0"	0 mm
1'-6" to <2'-0"	450 mm to <600 mm	1"	25 mm
2'-0" to <2'-6"	600 mm to <750 mm	1"	25 mm
2'-6" to <3'-0"	750 mm to <900 mm	1"	75 mm
3'-0" to <3'-6"	900 mm to <1.1 m	3"	75 mm
3'-6" to <4'-0"	1.1 m to <1.2 m	3"	75 mm
4'-0" to <4'-6"	1.2 m to <1.4 m	5"	125 mm
4'-6" to <5'-0"	1.4 m to <1.5 m	7"	175 mm

Figure 9B: NFPA 13 Obstruction Criteria Table 8.8.5.1.2