



TECHNICAL DATA

COIN® QR UPRIGHT FUSIBLE ELEMENT SPRINKLER VK901 (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 combustibles 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 4.2 (57 metric*), allows efficient use of available water supplies for hydraulically designed fire protection systems. The fusible link 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.

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 2) and solid wood or composite wood joist with upper deck filled with non-combustible insulation (see Figure 3).

COIN® Sprinklers can also be installed with steel pipe in protected areas constructed of solid wood joists (see Figure 4), and solid wood or composite wood joist with upper deck filled with non-combustible insulation (see Figure 5), and in open truss construction of both wood and steel trusses (see Figure 6).

When using steel pipe, COIN® Sprinklers can be applied as a dry system using air or gas as a supervisory medium (Figures 4, 5, and 6).



2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

Refer to the Approval Chart and Design Criteria on 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 2-6. The clearance from the sprinkler deflector to the roof is critical to operation of the sprinkler (refer to Figures 2-6). 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 sq ft (93 sq m). The draft curtain is required to protrude down from the top deck surface as specified herein.

3. TECHNICAL DATA

Specifications:

Available since 2007.

Minimum Operating Pressure: Refer to Design Criteria on this technical data page.

Rated to 175 psi (12 bar) water working pressure

Factory tested hydrostatically to 500 psi (34.5 bar)

Testing: U.S.A. Patent No. 4,831,870

Thread size: 1/2" (15 mm) NPT

Nominal K-Factor: 4.2 U.S. (57 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.

Overall Length: 2-1/4" (57 mm)

Material Standards:

Frame Casting: Brass UNS-C84400

Deflector: Brass UNS-C26000

Fusible Element Assembly: Nickel Alloy

Trigger and Support: Stainless Steel UNS-S31600

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

Seat and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400

Screw: Brass UNS-C36000

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Ordering Information: (Also refer to the current Viking price list.)
 Order the QR Upright Fusible Element COIN® Sprinkler using Part Number 12676AE.

Available Finishes And Temperature Ratings:
 Refer to Table 1.

Accessories: (Also refer to the Viking website.)

Sprinkler Wrench:
 Standard Wrench: Part No. 10896W/B (available since 2000).

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 fire conditions, the heat-sensitive fusible element assembly disengages, releasing the seat and spring assemblies to open the waterway. Water flowing through the sprinkler orifice strikes the sprinkler 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.

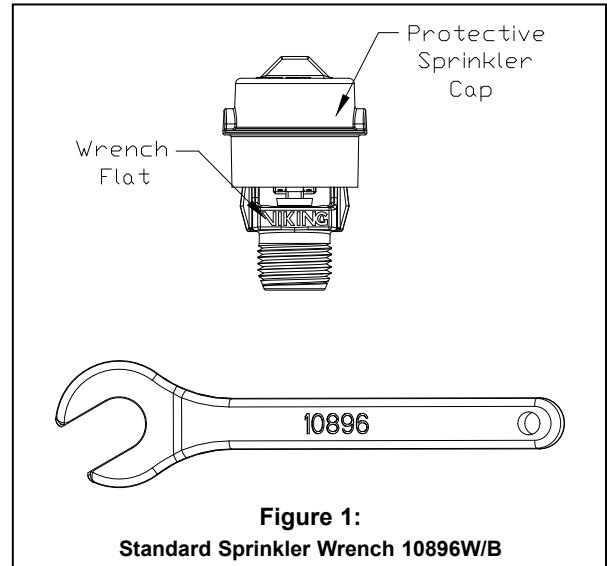


TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating ¹	Maximum Ambient Ceiling Temperature ²	Frame Paint Color
Intermediate	205 °F (96 °C)	150 °F (65 °C)	White

Sprinkler Finish: Brass

Footnotes

¹ The 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.

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<h3 style="margin: 0;">Approval Chart</h3> <p style="margin: 0; font-size: small;">COIN® Specific Application QR Upright Fusible Element Sprinkler VK901 For Light Hazard Occupancies Only</p>														
Part Number ¹	SIN	Maximum Pressure	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals ³ (Refer also to Design Criteria below.)					
			NPT	BSP	U.S.	metric ²	Inches	mm	cULus ⁴	FM	NYC	LPCB	CE	⚙
12676AE	VK901	175 psi	1/2"	15 mm	4.2	57	2-1/4	57	A1	--	See Footnote 5.	--	--	--
Approved Temperature Rating A - 205 °F (96 °C)							Approved Finish 1 - Brass							
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.														

DESIGN CRITERIA - CPVC PIPE (See Figures 2 and 3)
 (Also refer to the Approval Chart above)

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

APPLICATION

Horizontal interstitial concealed spaces constructed of engineered open wood trusses, non-combustible bar joist, and non-combustible insulation filled solid or composite wood joist construction having roof pitch of 0/12 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 sq ft (93 sq m).
- 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.
- For joist construction of solid wood or composite wood with solid filled non-combustible insulation, a solid wall or draft curtain (heat collection baffle) must drop below the joist a minimum of 6" (152 mm) and run laterally with the joist spaced at 25 ft (8 m) width maximum with maximum detection area of 1000 sq ft (93 sq m). The draft curtain must be constructed of material that will not allow heat to escape through or above it; this may be 1/4" (6.4 mm) thick plywood.

B. Concealed Space Height

Wood truss or non-combustible bar joist (Figure 2):

- Maximum height of the space: 36" (914 mm).
- Minimum height: 12" (305 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 3):

- Maximum depth of concealed space is 36" (914 mm) from bottom of upper deck joist to top of ceiling.
- Minimum depth is 8" (203 mm) from bottom of upper deck joist to top of ceiling joist or non-combustible ceiling insulation.

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DESIGN CRITERIA - CPVC PIPE (See Figures 2 and 3)

(Also refer to the Approval Chart on page 3)

(continued from page 4.)

C. System Type

- Light Hazard, Wet Pipe System

D. Minimum Density

- 0.10 gpm/sq ft (4.1 mm/min).

E. Spacing of COIN® Sprinklers

- Minimum Spacing: 7 ft (2.4 m)
- Maximum Spacing: 12 ft (3.7 m)

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

F. Maximum Area of Coverage

- 144 sq ft (13.4 sq m)

G. Minimum Operating Pressure

- 8.0 PSI (.55 Bar)

H. Obstructions

- All obstruction criteria per NFPA 13 for standard coverage sprinklers shall apply unless specified differently in this data sheet.

I. Remote Area

- 1000 sq ft (93 sq m)

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 VikingBlazeMaster®, 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. 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 ¾" (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 2 and 3 in order to protect the CPVC product.

The vertical sprinkler deflector clearance to the bottom of the roof deck is 2" to 4" (51 mm 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 2" (40 mm to 50 mm). Also, a draft curtain (heat baffle) made of plywood at least ¼" thick must drop below the joist 6" (152 mm) or 1/3 the space, whichever is smaller, and run laterally with the joist, spaced at 25 ft (8 m) width maximum, or solid wall construction to limit the area of detection coverage to 1000 sq ft (93 sq m).

When applying CPVC pipe with the COIN® Sprinkler, the system must be a wet pipe system only.

Also, with solid wood or wood composite joist construction, the upper joist must be completely filled with non-combustible insulation.

(continued on page 6.)



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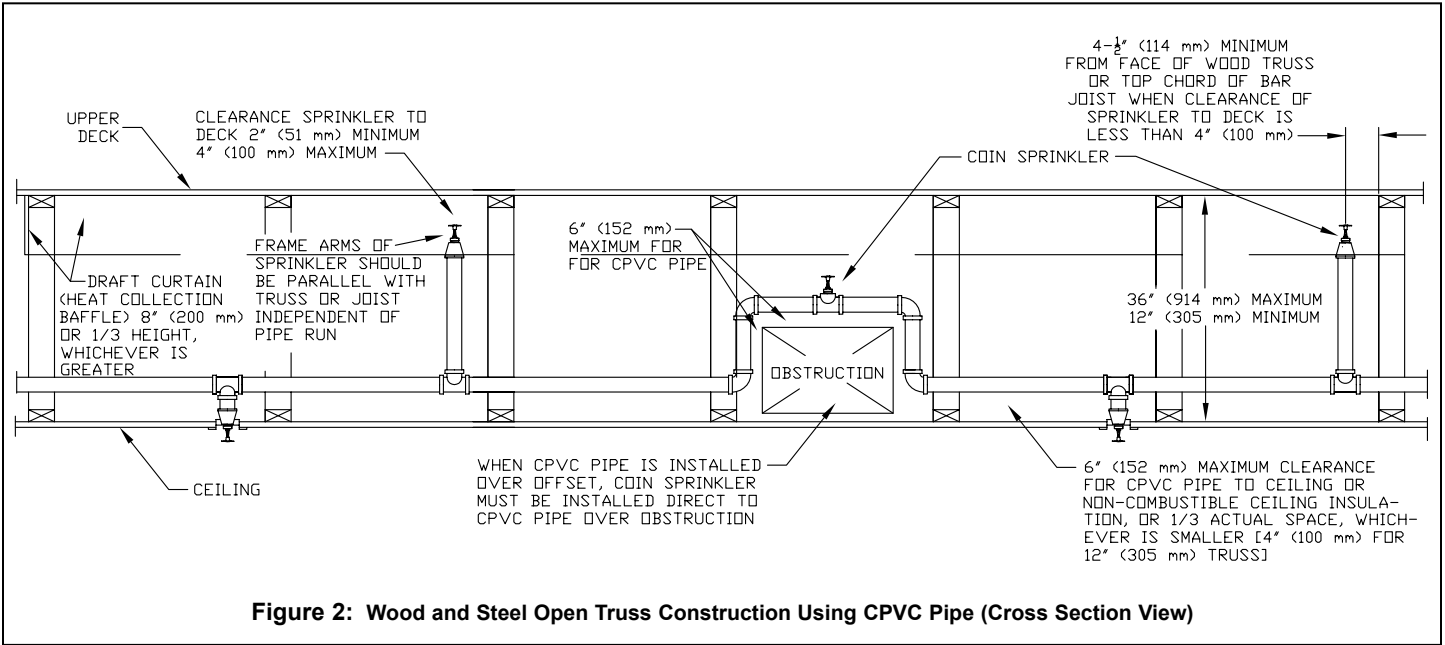


Figure 2: Wood and Steel Open Truss Construction Using CPVC Pipe (Cross Section View)

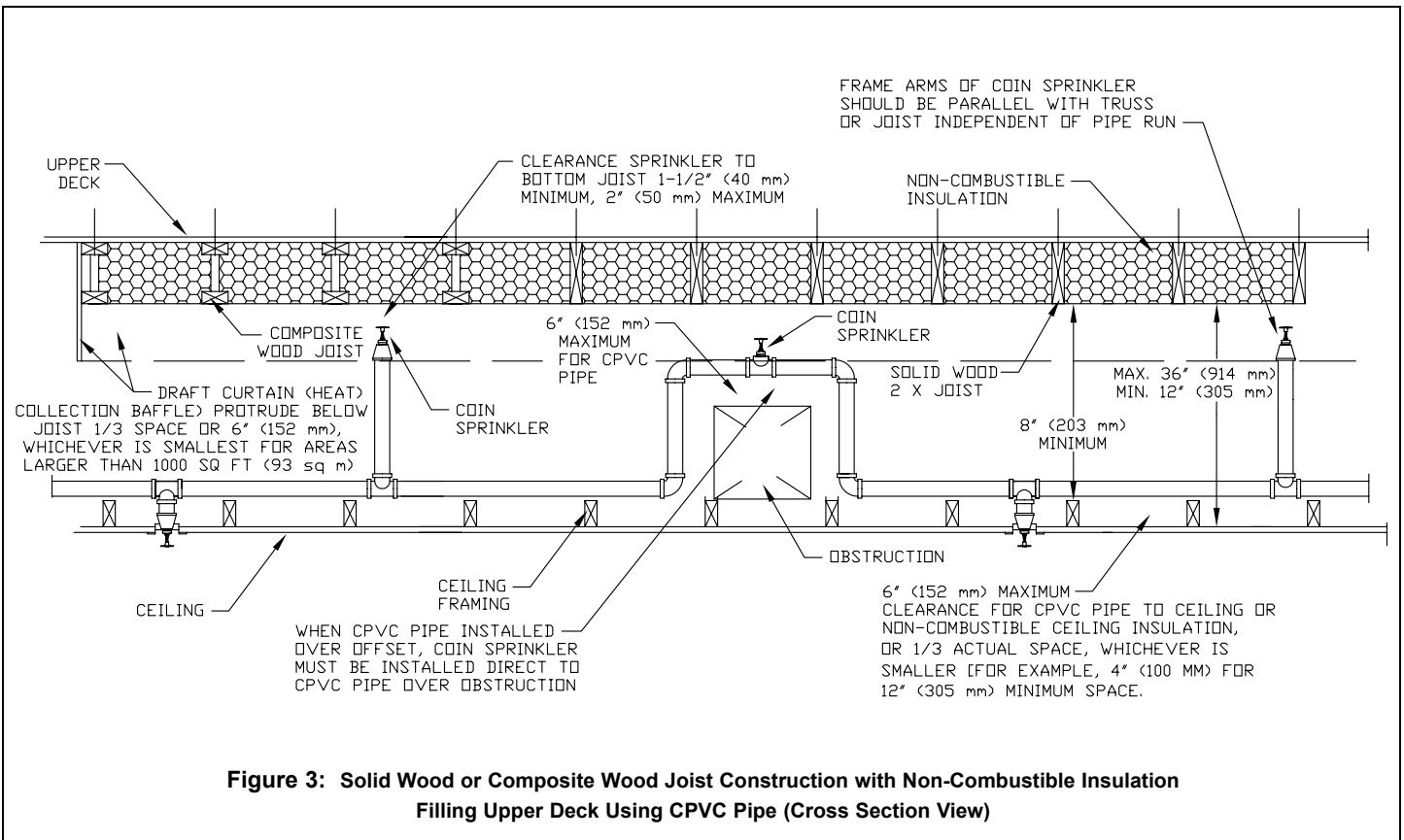


Figure 3: Solid Wood or Composite Wood Joist Construction with Non-Combustible Insulation Filling Upper Deck Using CPVC Pipe (Cross Section View)



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DESIGN CRITERIA - STEEL PIPE (See Figures 4, 5 and 6)

(Also refer to the Approval Chart on page 3)

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

APPLICATION

Horizontal concealed spaces of solid wood joist construction with a roof pitch of 0/12 to 2/12 maximum. The upper joist is constructed of solid wood or composite wood with a maximum depth of 12" (305 mm) typically on center of 16" (400 mm) 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 2 & 3 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 truss wood or steel construction; solid wood; or 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.

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 ft (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 smallest, and run laterally with the joist spaced at 25 ft (8 m) width maximum to limit the heat detection space to a maximum of 1000 sq ft (93 sq m). 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 is not required.

B. Concealed Space Height

Joist Construction:

- Maximum depth or height of concealed space: 36" (914 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): 54" (1 372 mm). See Figure 4.
- Minimum depth or height of concealed space: 6" (152 mm) from bottom of upper deck joist to top of ceiling frame joist.

Truss Wood or Steel:

- Maximum height from inside ceiling to inside deck of concealed space: 36" (914 mm).
- Minimum height from inside ceiling to inside deck of concealed space: 12" (305 mm).

C. System Type

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

D. Minimum Density

- 0.10 gpm/sq. ft. (4.1 mm/min).

E. Spacing of COIN® Sprinklers

- Minimum Space Between Sprinklers: 7 ft (2.1 m)
- Maximum Space Between Sprinklers: 12 ft (3.7 m)

F. Maximum Area of Coverage

- 144 sq ft (13.4 sq m)

G. Minimum Operating Pressure

- 8.0 PSI (.55 Bar)

H. COIN® Sprinkler Deflector Position

The COIN® Sprinkler shall be installed in the upright position. The frame arms can be installed parallel with the joist of upper deck or with the pipe.

For solid wood joist without insulation (Figure 4) or solid or composite wood with non-combustible filled joist (Figure 5):

- The sprinkler deflector must be 1-1/2" to 2" (40 mm to 50 mm) from the bottom of the upper deck joist. When the roof is pitched, the deflector must run parallel with the roof joist maintaining minimum and maximum clearances as specified.

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(continued from page 7.)

For truss construction, wood or steel bar joist (Figure 6):

- Sprinkler deflector must be 2" to 4" (51 mm to 100 mm) to upper deck bottom surface.

Obstruction criteria per NFPA for standard spray sprinklers apply, unless specified differently in this data sheet.

I. Remote Area

The remote area for wood truss construction or bar joist construction (Figure 6) or solid wood joist construction (Figure 4) is 1000 sq ft (93 sq m) for wet pipe systems or 1300 sq ft (121 sq m) for dry pipe systems.

The remote area for non-combustible insulation filled solid wood joist or wood composite joist construction (Figure 5) 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 on page 6. Extra sprinklers are not required or protection of pipe when offsetting for obstructions. Ceiling sprinklers below the concealed space may be fed from the same piping as the COIN® Sprinklers.

When acceptable to the Authority Having Jurisdiction, these sprinklers may be used in dry pipe systems when installed using corrosion-resistant or internally galvanized pipe.

Precedence for allowing 4.2K sprinklers to be used on dry pipe systems utilizing corrosion-resistant or internally galvanized steel pipe is based on paragraph 8.3.4.3 of NFPA 13 (2007 edition). The minimum operating pressure of 8.0 PSI (.55 Bar) referenced on this data sheet is based solely on specific fire tests conducted for cULus Listing.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Form 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.



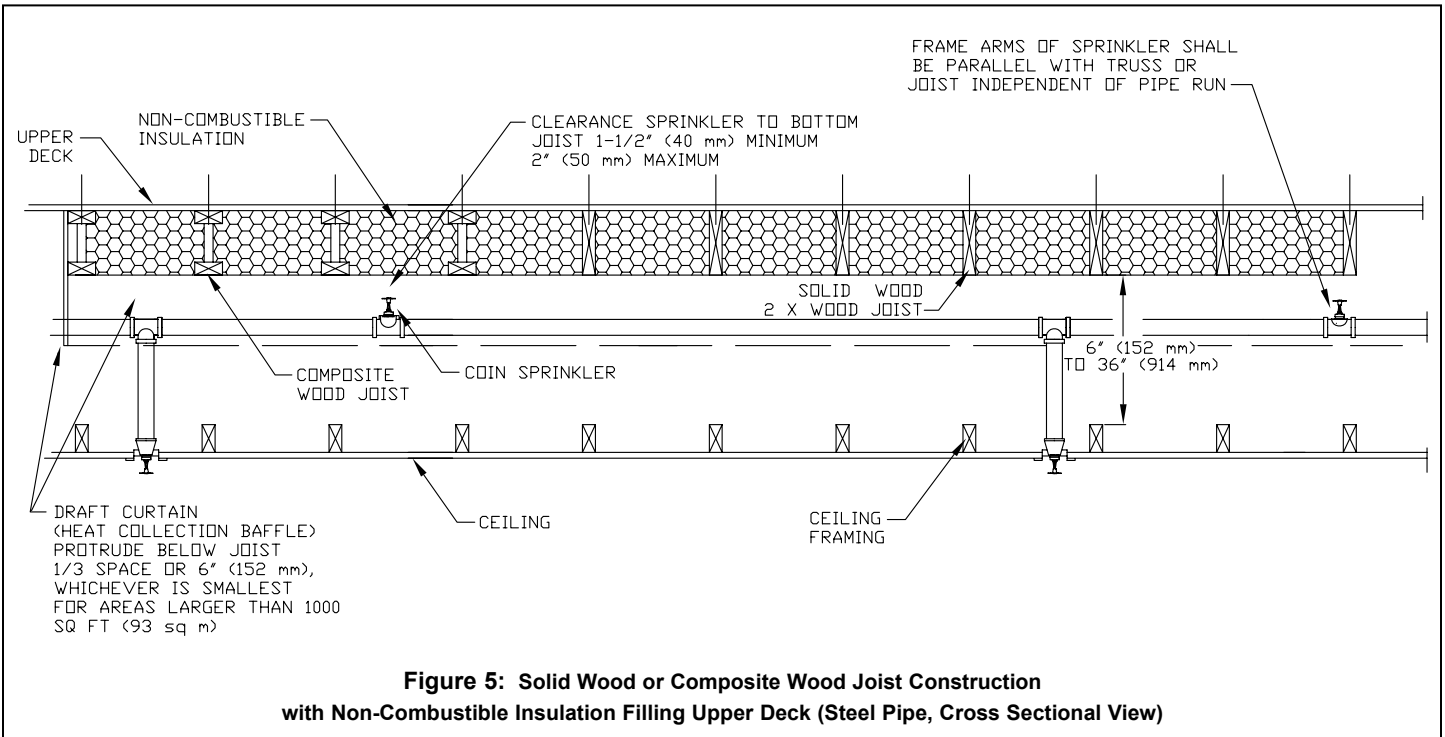
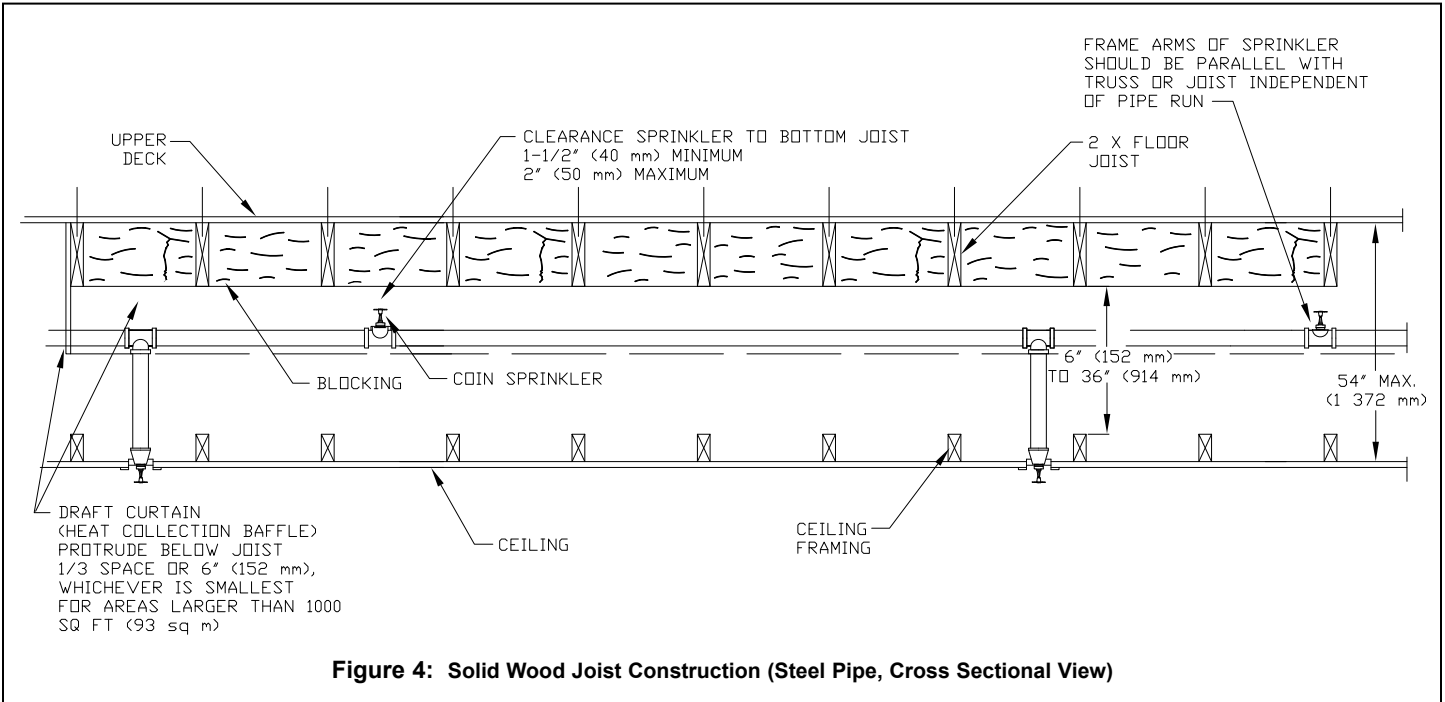
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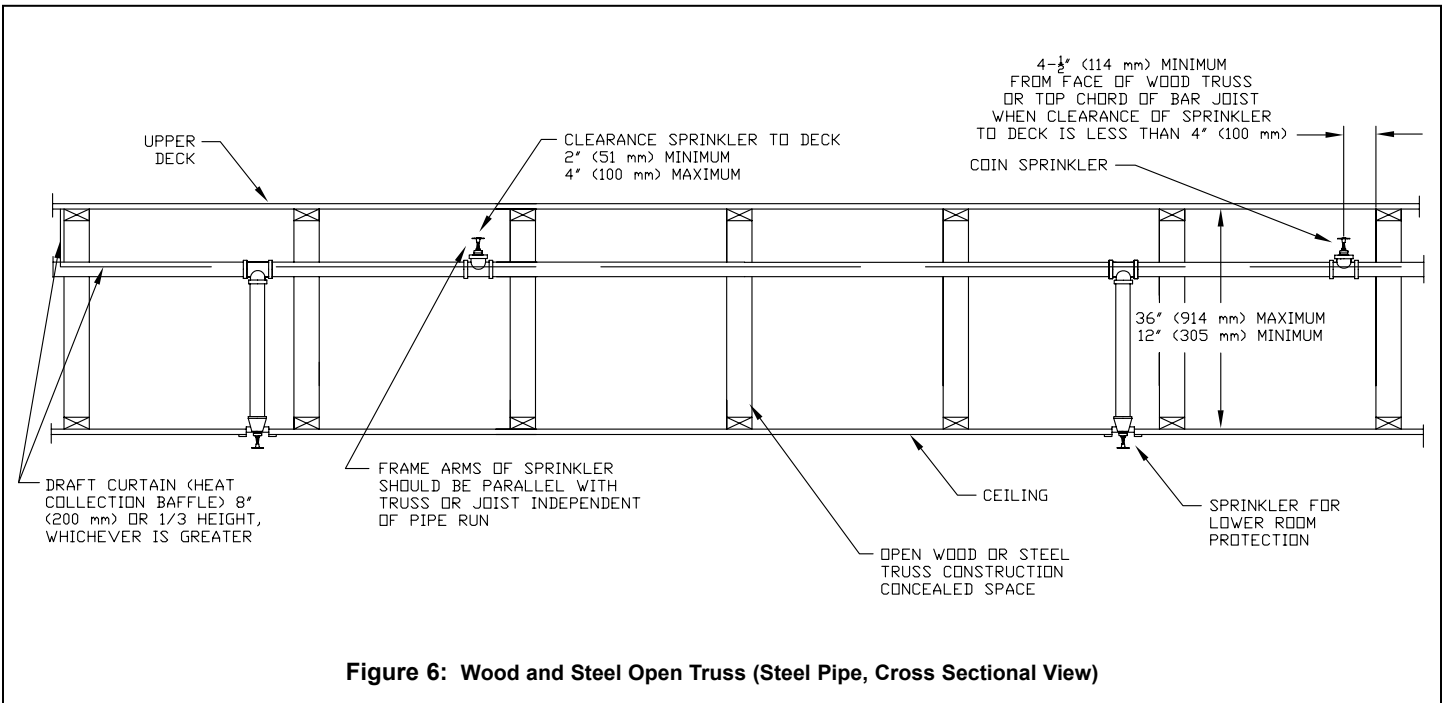


Figure 6: Wood and Steel Open Truss (Steel Pipe, Cross Sectional View)

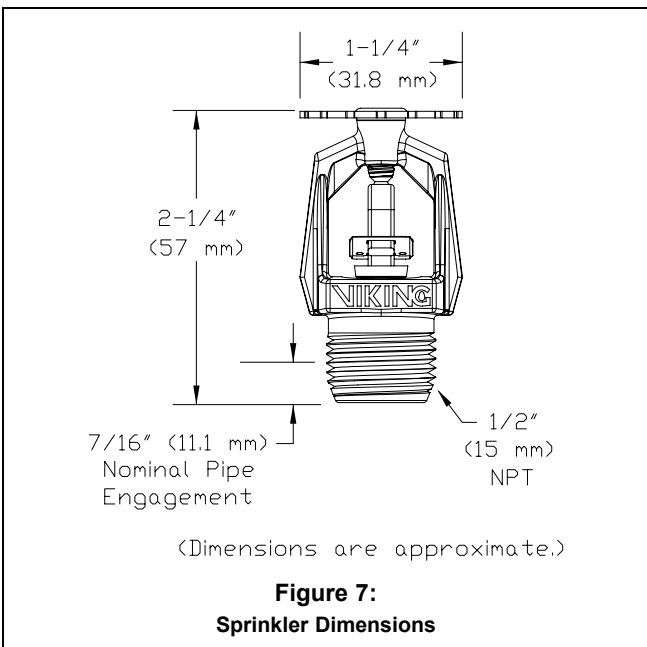


Figure 7:
Sprinkler Dimensions