

## Model CC3—4.2 and 5.6 K-factor Combustible Concealed Space Sprinklers Specific Application, Upright

### IMPORTANT

Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

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[docs.jci.com/tycofire/tpf633](http://docs.jci.com/tycofire/tpf633)

## General Description

The Model CC3 Combustible Concealed Sprinklers are quick response, upright, specific application sprinklers designed to provide protection of specific light hazard combustible, as well as non-combustible, concealed spaces requiring sprinkler protection. The Model CC3 Sprinklers comply with the criteria for the protection of combustible concealed spaces as described in NFPA 13.

The Model CC3 Sprinklers are designed for installation on BLAZE-MASTER CPVC wet pipe systems, other UL Listed CPVC pipe products,

and steel wet pipe or dry pipe sprinkler systems (see the respective Design Criteria sections). The Model CC3 Sprinklers are designed to be installed in the following arrangements for both wet CPVC and steel:

- 4.2K  
14 ft (4,3 m) maximum between sprinklers  
196 ft<sup>2</sup> (18,2 m<sup>2</sup>) maximum coverage area
- 5.6K  
16 ft (4,9 m) maximum between sprinklers  
256 ft<sup>2</sup> (23,8 m<sup>2</sup>) maximum coverage area
- 6 in. (152,4 mm) minimum height for joist with steel pipe or CPVC when insulation filled. 12 in. (305 mm) minimum height for all other arrangements and sizes
- 60 in. (1524 mm) maximum height from joist to joist and 84 in. (2134 mm) from floor to ceiling
- 60 in. (1524 mm) maximum height for truss and bar joist

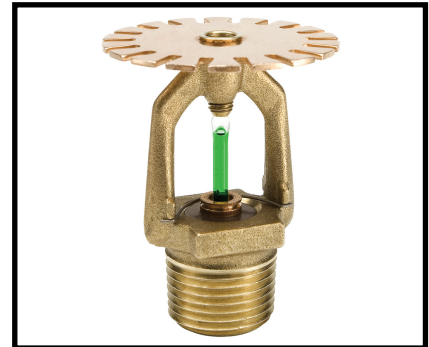
### NOTICE

The Model CC3 Combustible Concealed Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or product manufacturer with any questions.

## Sprinkler Identification Number

TY2199 – Upright, 4.2K  
TY3199 – Upright, 5.6K



## Technical Data

### Approvals

UL Listed

**Note:** Listings and approvals only apply to the service conditions indicated in the Design Criteria sections.

**Note:** Refer to CPVC manufacturer for information on specific Listings and Approvals where CPVC pipe and fittings are specified.

### Antifreeze Compatibility

Model CC3 TY2199 4.2K and TY3199 5.6K Sprinklers can be used with:

- LFP® Antifreeze in accordance with Technical Data Sheet TFP1680, LFP® Antifreeze Agency Listed Solution for Fire Sprinkler Systems
- LFP® Antifreeze+ in accordance with Technical Data Sheet TFP1682, LFP® Antifreeze+ Agency Listed Solution for Fire Sprinkler Systems

### Maximum Working Pressure

175 psi (12,1 bar)

### Pipe Thread Connection

½ in. NPT

### Discharge Coefficient

K = 4.2 GPM/psi<sup>1/2</sup> (60,5 LPM/bar<sup>1/2</sup>)  
K = 5.6 GPM/psi<sup>1/2</sup> (80,6 LPM/bar<sup>1/2</sup>)

### Temperature Rating

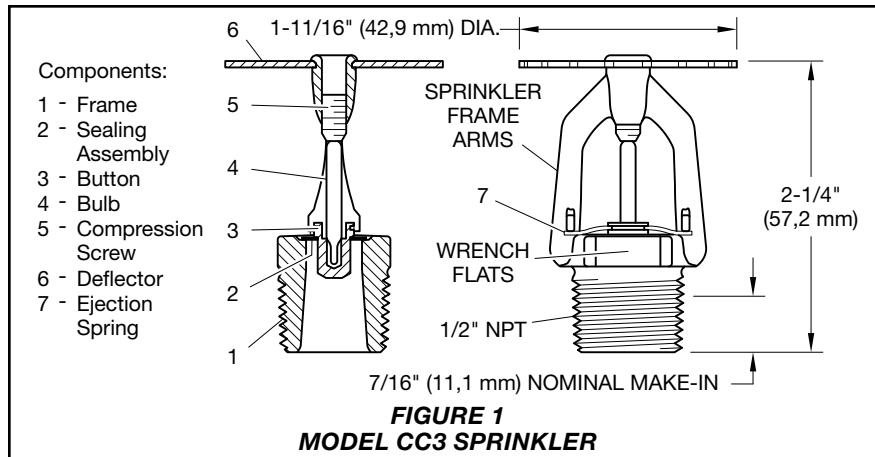
200°F (93°C)

### Finish

Natural Brass

### Physical Characteristics

Frame	Brass
Button	Bronze
Sealing Assembly	Beryllium Nickel w/TEFLON
Bulb	Glass (3 mm)
Compression Screw	Brass
Deflector	Bronze



## Operation

The glass bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb allowing the sprinkler to activate and flow water.

## Design Criteria

Design criteria is provided as follows:

1. 200°F (93°C), Model CC3 Combustible Concealed Sprinklers with CPVC pipe and horizontal slope above sprinklers not exceeding 2:12, see Area of Use (CPVC Pipe)
2. 200°F (93°C), Model CC3 Combustible Concealed Sprinklers with steel pipe and horizontal slope above sprinklers not exceeding 2:12, see Area of Use (Steel Pipe)
3. For the installation of Model CC3 Combustible Concealed Sprinklers installed with baffles at 2000 ft² (186 m²), the design of the system should be 6 sprinklers or 1000 ft² (93 m²), whichever is greater.
4. For the installation of 5.6K Model CC3 Combustible Concealed Sprinklers installed without the use of draft curtains for unobstructed solid wood truss construction on edge or on face or unobstructed bar joist construction, the design of the system should be 9 sprinklers or 1000 ft² (93 m²), whichever is greater.
5. Sprinklers may not be installed such that the deflector is above the bottom of the top chord of trusses or joists.

6. Gusset plates, truss members, or bar joist members (other than top chords) shall not be considered obstructions provided a minimum 4-1/2 in. (114 mm) lateral distance from the edge of the member to the centerline of the sprinkler (required by the specific application listing) is maintained.

7. Where the Tyco Model CC3 sprinkler is spaced over 225 ft² (20,9 m²), apply the obstruction rules found in NFPA 13 for extended coverage sprinklers, except as noted in Item 6 above.

8. Where the Tyco Model CC3 sprinkler is spaced 225 ft² (20,9 m²) or less, apply the obstruction rules found in NFPA 13 for standard spray sprinklers, except as noted in Item 6 above.

## Design Criteria, CPVC Pipe

### Area of Use (CPVC Pipe)

Horizontal (slope not exceeding 2:12) combustible concealed spaces of:

- Unobstructed wood truss construction or unobstructed bar joist construction, see Figure 2
- Non-combustible, insulation-filled solid wood or composite wood joist construction, see Figures 3 and 4

**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 Model CC3 Sprinklers in the event of a fire.

### Concealed Space Area (CPVC Pipe)

The area of the concealed space is not limited.

The 4.2K sprinkler is UL listed for a 1000 ft² (93 m²) draft curtain area as shown in Figures 2, 3, and 4.

The 5.6K sprinkler is UL Listed for a 2000 ft² (186 m²) draft curtain area as shown in Figures 3 and 4. In addition, it may be used without draft curtains as shown in Figure 2 for unobstructed wood truss construction, on edge or on face, or for unobstructed bar joist construction.

This draft curtain shall be at least 1/3 the depth of the concealed space or 8 in. (200 mm), whichever is greater, and be constructed using a material that will not allow heat to escape through or above the draft curtain.

For information about the use of anti-freeze see the Technical Data section.

### Concealed Space Size (CPVC Pipe)

The depth of the concealed space is 60 in. (1524 mm) maximum to 6 in. (152 mm) minimum.

### System Type (CPVC Pipe)

Light hazard, wet pipe system

### Maximum Distance Between

#### Model CC3 Sprinklers (CPVC Pipe)

TY2199 4.2K.....	14 ft (4,3 m)
TY3199 5.6K.....	16 ft (4,9 m)

### Maximum Coverage Area (CPVC Pipe)

TY2199 4.2K.....	196 ft² (18,2 m²)
TY3199 5.6K.....	256 ft² (23,8 m²)

### Minimum Distance Between Model CC3 Sprinklers (CPVC Pipe)

Minimum sprinkler spacing is 7 ft (2,1 m)

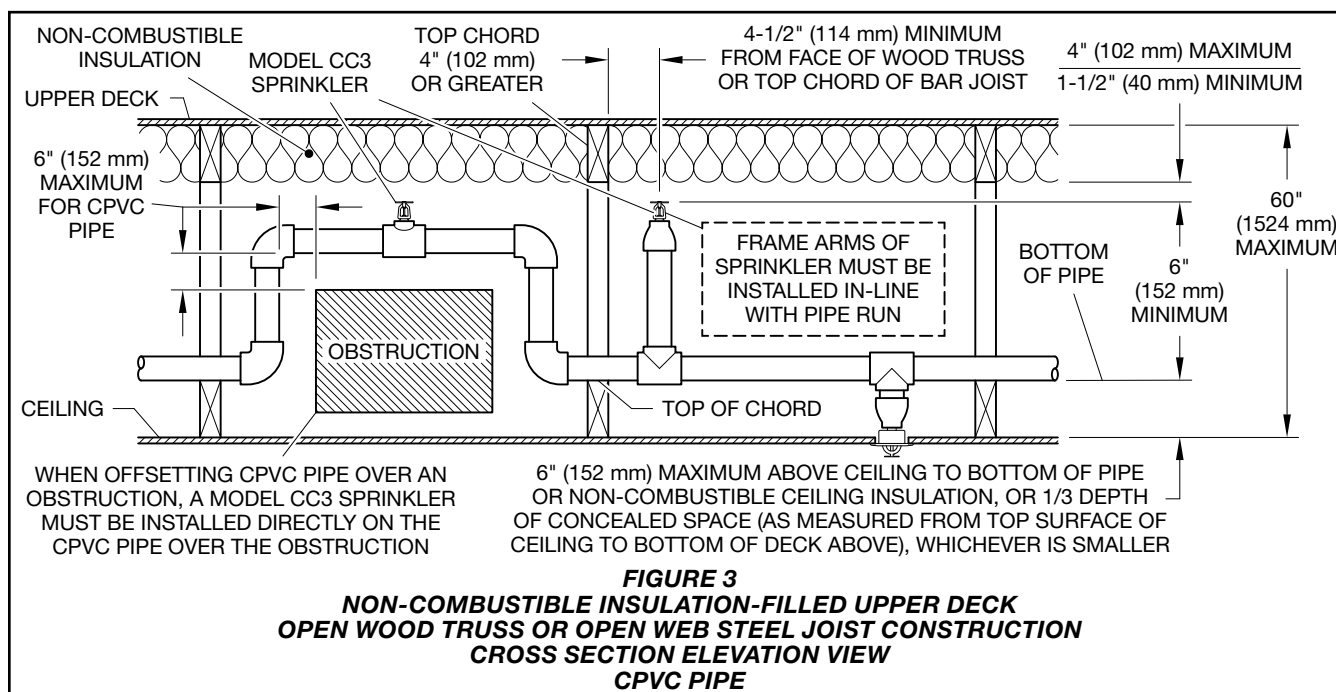
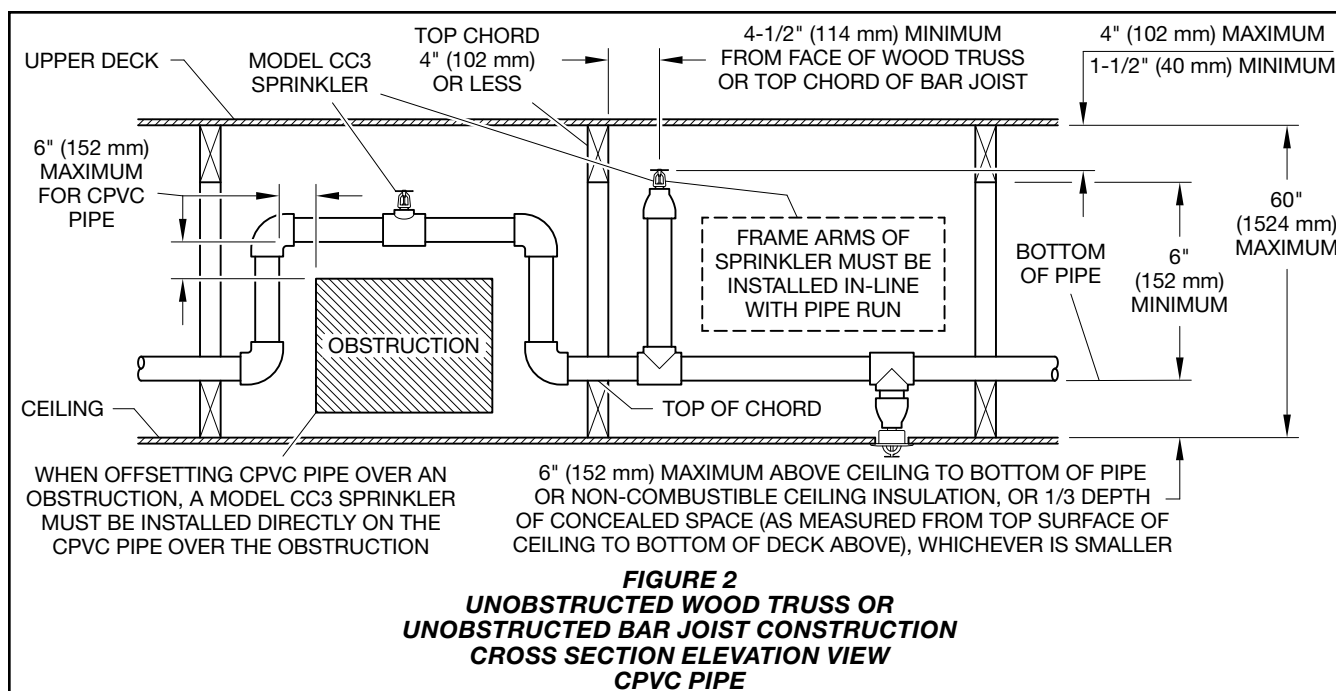
**NOTE:** Minimum spacing does not apply to any additional sprinklers required for protection of CPVC pipe that is offset over an obstruction.

### Deflector Position (CPVC Pipe)

- 1-1/2 in. to 4 in. (40 to 100 mm) below upper deck for wood truss construction or bar joist construction, see Figure 2
- 1-1/2 in. to 4 in. (40 to 100 mm) below solid wood or composite wood joists, see Figures 3 and 4

### Minimum Distance Away From Trusses (CPVC Pipe)

4-1/2 in. (114 mm)



#### Remote Area (CPVC Pipe)

The remote area is 1000 ft<sup>2</sup> (93 m<sup>2</sup>)

The remote area for unobstructed solid wood truss construction or unobstructed bar joist construction without the use of draft curtains is 9 sprinklers or 1000 ft<sup>2</sup> (93 m<sup>2</sup>), whichever is greater.

**NOTE:** The remote area does not include any additional sprinklers required for protection of CPVC pipe that is offset over an obstruction.

#### Required Minimum Density

(CPVC Pipe)

0.10 gpm/ft<sup>2</sup> (4,1 mm/min)

#### Minimum Operating Pressure

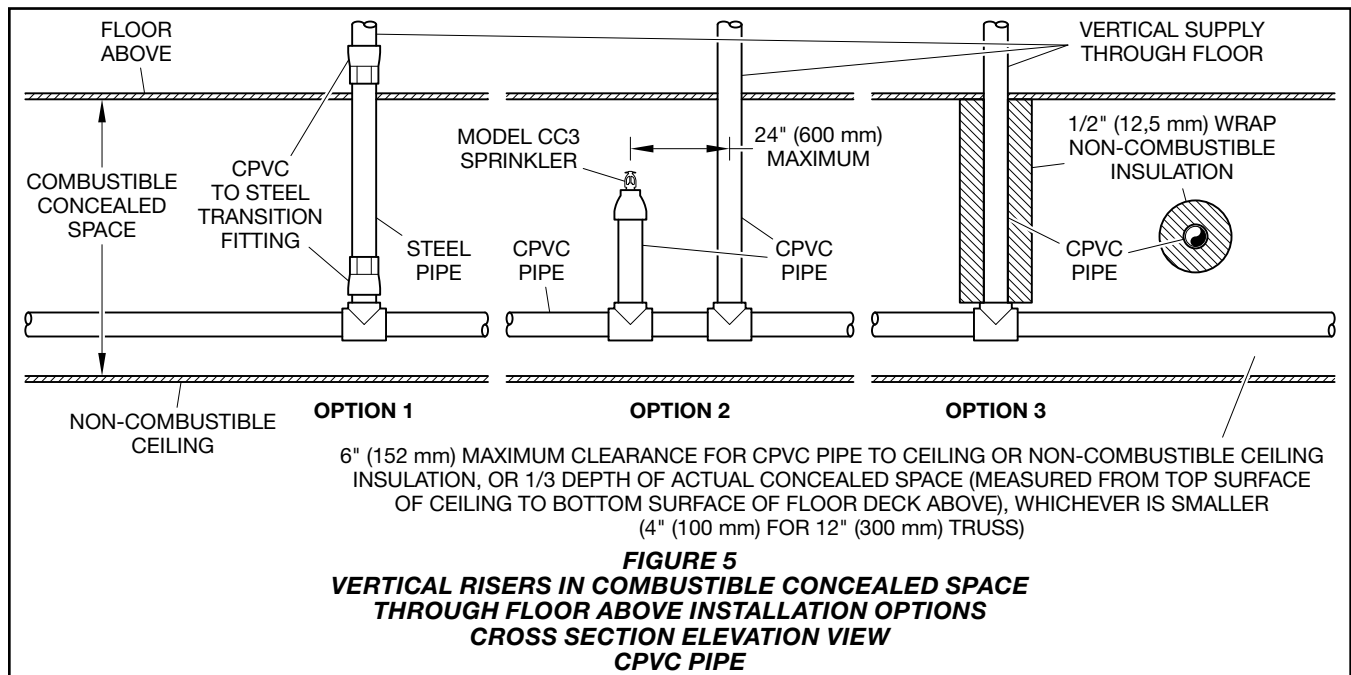
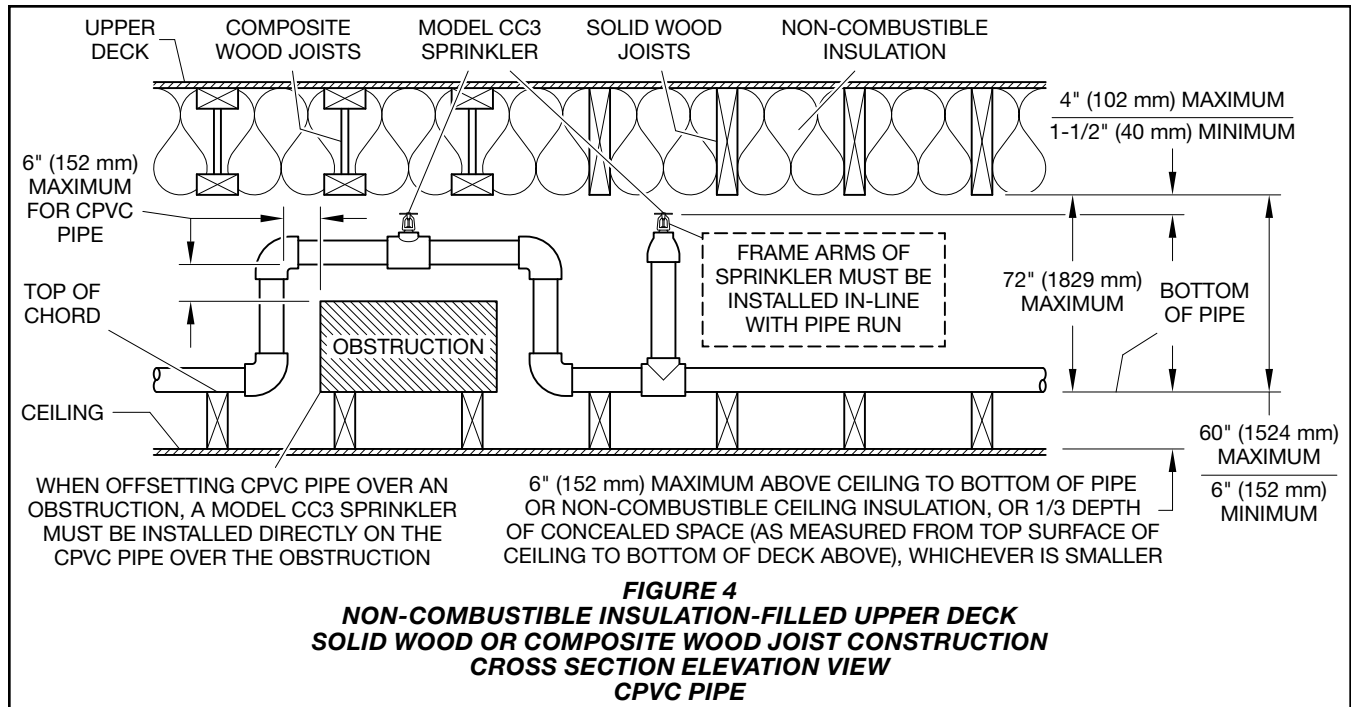
(CPVC Pipe)

7 psi (0,48 bar)

#### Use of UL Listed CPVC Pip

with Model CC3 Sprinklers

CPVC product may be used in concealed spaces requiring automatic sprinklers, when used in conjunction with Model CC3 Sprinklers. In order to use the CPVC product for wood truss or bar joist construction, the horizontal run of pipe must be a maximum of 6 in. (150 mm) above the ceiling or noncombustible ceiling insulation, or 1/3 the depth of concealed space (as measured from the top surface of the



ceiling to the bottom of the deck above), whichever is smaller, see Figure 2. For insulation-filled solid wood or composite wood joist construction, the horizontal run of pipe must be a maximum of 6 in. (150 mm) above ceiling or non-combustible ceiling insulation, or 1/3 the depth of concealed space (as measured from the top surface of the ceiling to the bottom surface of the joist insulation above), whichever is smaller, see Figures 3 and 4. The CPVC pipe can then be used to supply the Model CC3 Sprinklers, as well as the sprin-

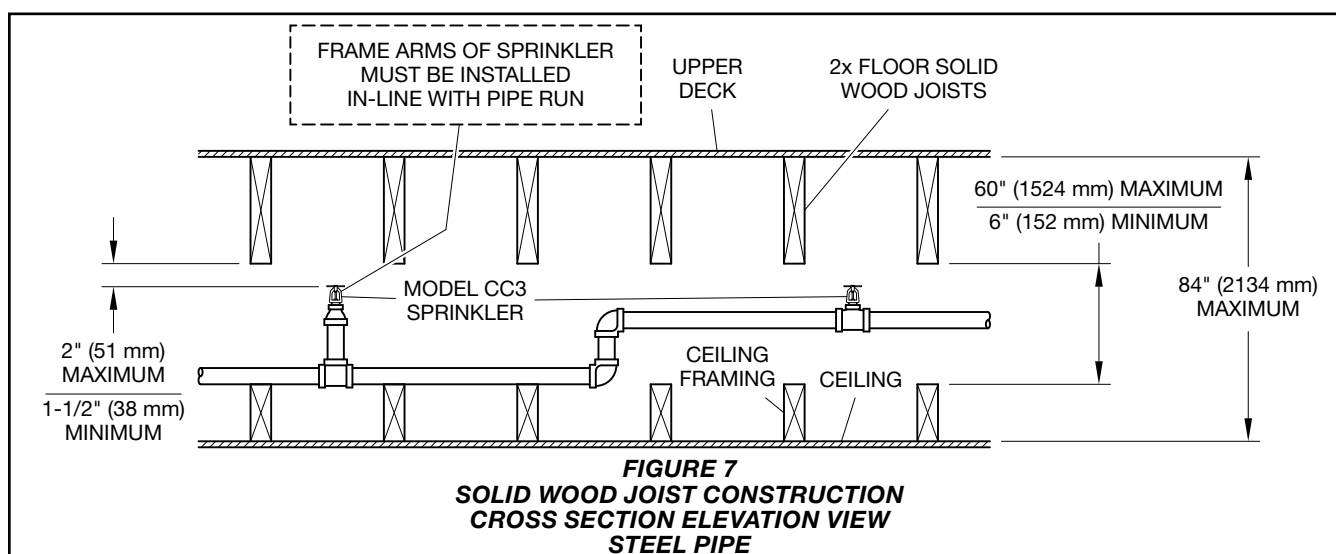
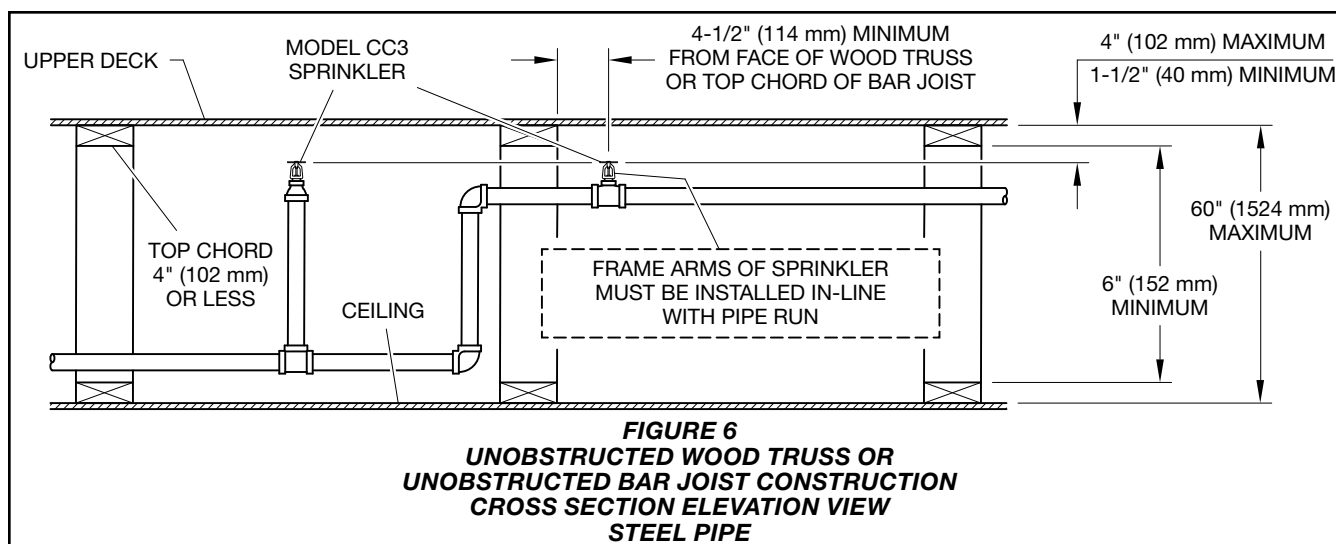
klers below the ceiling. Unless modified by this technical data sheet, all other guidelines of the CPVC manufacturer instructions must be met. When using 1 in. (DN25) or larger pipe, a hanger must be located at the truss nearest a sprig for purposes of restraint. If using 3/4 in. (DN20) piping, all sprigs over 12 inches (305 mm) must be laterally braced using methods described in the NFPA standards.

Where the CPVC must be offset up and over an obstruction and the pipe exceeds the allowed horizontal posi-

tioning requirements specified above as well as shown in Figures 2, 3, and 4 additional Model CC3 Sprinklers are to be installed as shown in Figures 2, 3, and 4 to protect the CPVC pipe and fittings.

A minimum lateral distance of 18 in. (460 mm) must be maintained between the CPVC pipe and heat pumps, fan motors, and heat lamps.

Where CPVC piping is installed as a vertical riser to the next floor above, see Figure 5 for installation options.



## Design Criteria, Steel Pipe

### Area of Use (Steel Pipe)

Horizontal (slope not exceeding 2:12) combustible concealed spaces of:

- unobstructed wood truss construction or unobstructed bar joist construction, see Figure 6
- solid wood joist construction, see Figure 7, where the upper deck and ceiling joists may have a maximum depth of 12 inches (300 mm) and typical on center joist spacing of minimum 16 inches (400 mm).
- non-combustible insulation-filled solid wood joist or wood composite joist construction, see Figure 8
- Obstructed wood truss construction, see Figure 9

**NOTE:** In order to be considered “non-combustible insulation-filled solid wood joist 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 Model CC3 Sprinklers in the event of a fire.

### Concealed Space Area (Steel Pipe)

The area of the concealed space is not limited; however,

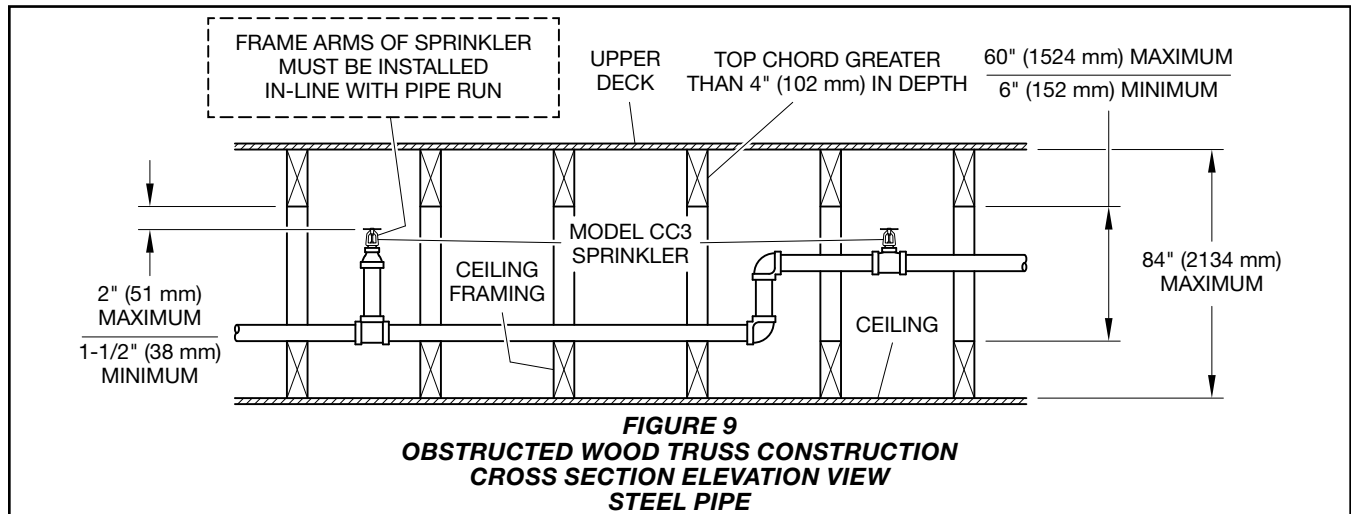
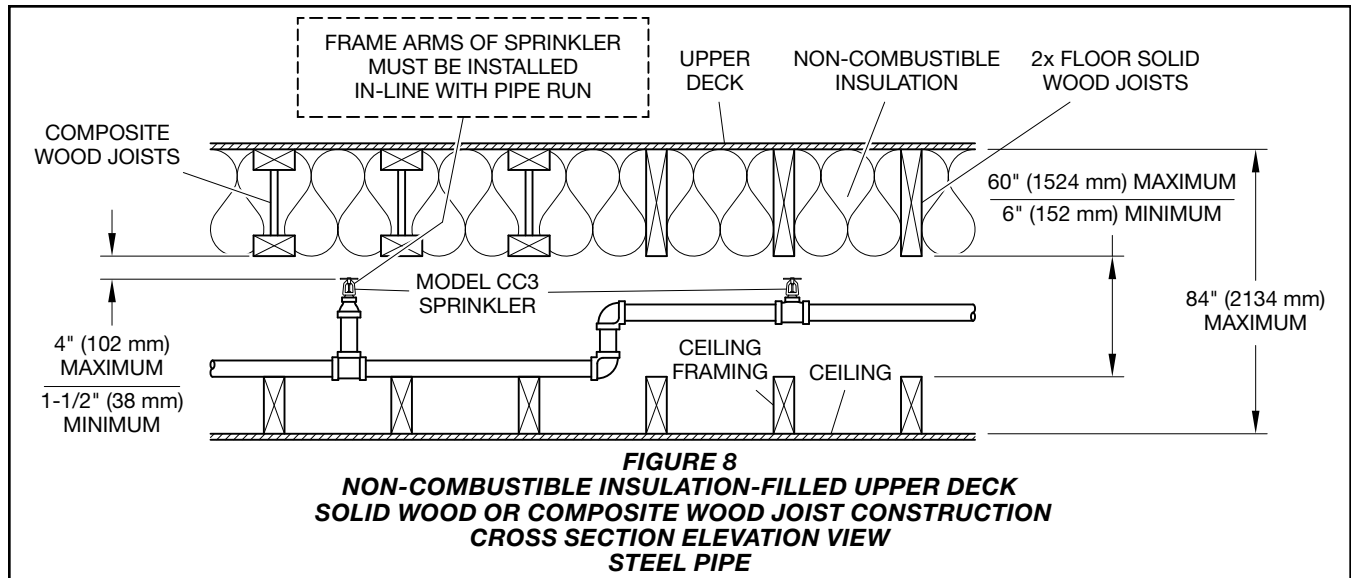
- For unobstructed wood truss construction or concealed spaces of non-combustible, unobstructed bar joist construction, see Figure 6, draft curtains or full height walls must be provided at 1000 ft<sup>2</sup> (93 m<sup>2</sup>) areas. In addition, the 5.6K sprinkler is UL Listed for a 2000 ft<sup>2</sup> (186 m<sup>2</sup>)

draft curtain area as well as without draft curtains for unobstructed solid wood truss construction on edge or on face or unobstructed bar joist construction.

This draft curtain shall be at least 1/3 the depth of the concealed space or 8 in. (200 mm), whichever is greater, and be constructed using a material that will not allow heat to escape through or above the draft curtain.

- For solid wood joist construction, see Figure 7, and obstructed wood truss construction, see Figure 9:

Blocking must be provided in each upper deck and ceiling joist channel at a maximum 32 ft (9.75 m) intervals. This blocking shall be installed to the full depth of the joists and be installed so as to not allow heat to escape through or above the blocking. The blocking must be constructed using a non-combustible material or the joist construction material.



Draft curtains must protrude below the joist a minimum of 6 inches (150 mm) or 1/3 the depth of the concealed space, whichever is greater, and run parallel with the joist spaced at 31 ft (9.4 m) width maximum to limit the area to a maximum of 1000 ft<sup>2</sup> (93 m<sup>2</sup>). For information about the use of antifreeze see the Technical Data section.

The draft curtains are to be constructed using a material that will not allow heat to escape through or above the draft curtain.

- For non-combustible, insulation-filled solid wood joist or composite wood joist construction, see Figure 8, the requirement for draft curtains and blocking does not apply.
- For information about the use of antifreeze see the Technical Data section.

#### **Concealed Space Size (Steel Pipe)**

The minimum and maximum concealed space depth is as follows:

For unobstructed wood truss construction or concealed spaces of unobstructed bar joist construction, see Figure 6, the maximum depth of the concealed space is 60 in. (1524 mm) from bottom of upper deck to top of ceiling, and the minimum depth is 6 in. (152 mm) from the bottom of the upper chords to the top of the lower chords.

For solid wood joist construction, see Figure 7, and solid wood or composite wood joist construction the maximum depth of the concealed space is 84 in.

(2134 mm) from bottom of upper deck to top of ceiling, and the minimum depth is 6 in. (152 mm) from the bottom of the upper deck joists to the top of the ceiling joists. If joist construction is filled with non-combustible insulation the maximum height of the space is 84 in. (2134 mm). See Figure 7.

For obstructed wood truss construction, see Figure 9, the maximum depth of the concealed space is 84 in. (2134 mm) from bottom of upper deck to top of ceiling, and the minimum depth is 6 in. (152 mm) from the bottom of the upper chord to the top of the lower chord.

### System Type (Steel Pipe)

Light hazard, wet or dry pipe system

**NOTES:** Use of the 4.2K sprinklers in dry pipe systems is permitted by section 8.3.4.4 of NFPA 13 (2013 edition) where piping is corrosion resistant or internally galvanized.

### Maximum Distance Between Model CC3 Sprinklers (Steel Pipe)

TY2199 4.2K ..... 14 ft (4,3 m)  
TY3199 5.6K ..... 16 ft (4,9 m)

### Maximum Coverage Area (Steel Pipe)

TY2199 4.2K ..... 196 ft<sup>2</sup> (18,2 m<sup>2</sup>)  
TY3199 5.6K ..... 256 ft<sup>2</sup> (23,8 m<sup>2</sup>)

### Minimum Distance Between Model CC3 Sprinklers (Steel Pipe)

Minimum sprinkler spacing is 7 ft (2,1 m)

### Deflector Position (Steel Pipe)

1-1/2 in. to 4 in. (40 mm to 100 mm) below upper deck for wood truss construction or concealed spaces of non-combustible bar joist construction, see Figure 6.

1-1/2 in. to 2 in. (40 to 50 mm) below solid wood joist, see Figure 6, or top chord of a wood truss that has a depth greater than 4 in, see Figure 9.

1-1/2 in. to 4 in. (40 to 100 mm) below non-combustible insulation-filled solid wood joists or composite wood joists, see Figure 8.

### Remote Area (Steel Pipe)

The remote area for wood truss construction or bar joist construction, see Figure 6, solid wood joist construction, see Figure 7, or obstructed wood truss construction, see Figure 9, is 1000 ft<sup>2</sup> (93 m<sup>2</sup>) for wet pipe or dry pipe systems.

The remote area for unobstructed solid wood truss construction or unobstructed bar joist construction without the use of draft curtains is 9 sprinklers or 1000 ft<sup>2</sup> (93 m<sup>2</sup>), whichever is greater, for both wet pipe or dry pipe systems.

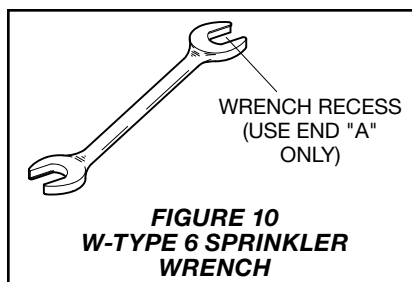
The remote area for non-combustible insulation-filled solid wood joist or wood composite joist construction, see Figure 8, without draft curtains is to be calculated per the requirements of NFPA 13.

### Required Minimum Density (Steel Pipe)

0.10 gpm/ft<sup>2</sup> (4,1 mm/min)

### Minimum Operating Pressure (Steel Pipe)

7 psi (0,48 bar)



**FIGURE 10**  
**W-TYPE 6 SPRINKLER**  
**WRENCH**

## Installation

The Model CC3 Sprinklers must be installed in accordance with this section.

### General Instructions

The Model CC3 Sprinklers are to be installed upright and with their frame arms, see Figure 1, in-line with the pipe run. See Figures 2 through 9, as applicable.

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1/16 in. (1,6 mm) for the 200°F (93°C) temperature rating.

A leak-tight 1/2 in. NPT sprinkler joint should be obtained with a torque of 7 to 14 lb-ft (9,5 to 19,0 N·m). Higher levels of torque may distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

The Model CC3 Sprinklers must only be installed in the upright position with the deflector parallel to the upper deck. With pipe thread sealant applied to the pipe threads, use only the W-Type 6 (End A) Sprinkler Wrench, see Figure 10, for installation of the Model CC3 Sprinklers by applying the wrench to the sprinkler wrench flats only.

## Care and Maintenance

The Model CC3 Sprinklers must be maintained and serviced in accordance with this section.

Before closing a fire protection system main control valve for maintenance work on the fire protection system that it controls, permission to shut down the affected fire protection systems must be obtained from the proper authorities and all personnel who may be affected by this action must be notified.

Sprinklers that are found to be leaking or exhibiting visible signs of corrosion must be replaced.

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified sprinklers must be replaced. Sprinklers that have been exposed to corrosive products of combustion, but have not operated, should be replaced if they cannot be completely cleaned by wiping the sprinkler with a cloth or by brushing it with a soft bristle brush.

Care must be exercised to avoid damage to the sprinklers before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. See the Installation section.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION, for example, NFPA 25, in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

## Limited Warranty

For warranty terms and conditions, visit [www.tyco-fire.com](http://www.tyco-fire.com).

## Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name and Part Number (P/N).

### Sprinkler Assemblies with NPT Thread Connections

Specify: SIN (specify), K-factor (specify), Model CC3 Combustible Concealed Space Sprinkler, Specific Application, Upright, 200°F (93°C), P/N (specify):

TY2199, 4.2K ..... 51-311-1-200  
TY3199, 5.6K ..... 51-301-1-200

### Sprinkler Wrench:

Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387

