# FREEDOM® RESIDENTIAL CONCEALED PENDENT SPRINKLER VK494 (K4.9)

TECHNICAL DATA

**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 Freedom® Residential Concealed Pendent sprinkler VK494 is a small thermosensitive, glass-bulb residential sprinkler designed for installation on concealed pipe systems where the appearance of a smooth ceiling is desired. The orifice design allows the sprinkler's efficient use of available water supplies for the hydraulically designed fire-protection system. The glass bulb operating element and special deflector characteristics meet the challenges of residential sprinkler standards.

**Features:**

- K4.9 (70.6 metric)
- Fast response glass bulb operating element.
- Integral threaded adapter cup accepts push-on or thread-on cover plates.
- Low-profile, small diameter, removeable cover plates offer almost flush appearance upon installation and allow ease of maintenance.
- Protective cap prevents damage during installation and ceiling finishing and keeps errant overspray from coating internal parts.
- Various finishes available to meet design requirements.
- Optional Electroless Nickel PTFE (ENT) coating provides corrosion resistance (see Approval Chart).

## 2. LISTINGS AND APPROVALS

**cULusEU Listed:** Category VKKW
Refer to the Approval Charts and Design Criteria for C-UL-US-EU Listing requirements that must be followed.

## 3. TECHNICAL DATA

**Specifications:**
Minimum Operating Pressure: Refer to the Approval Chart.
Maximum Working Pressure: 175 psi (12 bar). Factory tested hydrostatically to 500 psi (34.5 bar).
Thread size: 1/2" (15 mm) NPT
Nominal K-factor: 4.9 U.S. (70.6 metric*)
Glass-bulb fluid temperature rating: to -65 °F (-55 °C)

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

**Material Standards:**
Sprinkler Body: Brass UNS-C84400, QM brass, or DZR brass
Deflector: Phosphor bronze UNS-C51000
Deflector Pins: Stainless steel UNS-S30200
Button: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
Compression Screw: 18-8 Stainless Steel
Yoke: Phosphor Bronze UNS-C51000
Belleville Spring Sealing Assembly: Beryllium nickel alloy, coated on both sides with PTFE tape
Cover Adapter: Cold Rolled Steel JIS G3141 and Carbon Steel UNS-G10100 (per JIS G3141)
Shipping Cap: High Density Polyethylene
Vibration damper ring: Buna-N Rubber SAE AS-568-017

**Cover Plate Materials:**
Cover Plate Assembly: Copper UNS-C11000 and brass UNS-C26800 or stainless steel UNS-S30400
Spring: Beryllium Nickel
Solder: Eutectic

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

## 4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

## 5. OPERATION

During fire conditions, when the temperature around the sprinkler approaches the cover plate's nominal temperature rating, the cover plate detaches and releases the deflector. Continued heating of the exposed sprinkler causes the heat-sensitive liquid in the glass bulb to expand. When the temperature reaches the sprinkler's nominal temperature rating, the glass bulb shatters releasing the yoke, pip cap assembly and sealing spring. Water begins flowing through the sprinkler orifice and strikes the deflector forming a uniform spray pattern over a specific area of coverage, which is determined by the water supply pressure at the sprinkler, in order to extinguish or control the fire.

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## 6. INSPECTIONS, TESTS AND MAINTENANCE

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

## 7. AVAILABILITY

Viking Sprinkler Model VK494 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: SPRINKLER ORDERING INFORMATION

**Ordering Instructions:**
**(1) Select a sprinkler base part number**
**(2) Add the suffix for the desired finish**
**(3) Add the suffix for the desired sprinkler temperature rating**
**(4) Order a cover plate (Must be ordered separately; refer to Table 2)**

**Example:**
**23707AE = 200 °F (93 °C) Temperature rated sprinkler with a standard brass finish.**

| Sprinkler Base Part Number[1] | Size | 1: Finishes | | 2: Temperature Ratings[5] | | | |
|---|---|---|---|---|---|---|---|
| | NPT Inch | Description | Suffix | Nominal Rating | Bulb Color | Max. Ambient Ceiling Temperature[2] | Suffix |
| 23707 | 1/2 | Brass | A | 155 °F (68 °C) | Red | 100 °F (38 °C) | B |
| | | ENT[3,4] | JN | 200 °F (93 °C) | Green | 150 °F (65 °C) | E |

**Accessories**

| Part Number | Description |
|---|---|
| 23143 | Installation wrench[6] |
| 14412 | Small concealed cover plate installer tool; requires a piece of 1" PVC pipe or similar to attach (available since 2007). |
| 14867 | Large concealed cover plate installer tool; requires a piece of 1" PVC pipe or similar to attach (available since 2007). |
| 01731A | Sprinkler cabinet; holds up to 6 sprinklers (available since 1971). |

**Footnotes**

1. Part number shown is the base part number. For complete part number, refer to the current Viking price list schedule.
2. Based on NFPA 13, NFPA 13R, and NFPA 13D. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
3. cULusEU listed as corrsion resistant.
4. 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 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.
5. The sprinkler temperature rating is stamped on the deflector.
6. The installation wrench is intended to be used for a maximum of 500 sprinkler installations at a maximum torque of 14 ft-lbs (19 Nm).

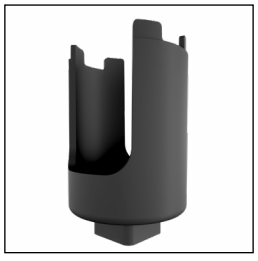

**Figure 1: Installation Wrench**

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## TABLE 2: COVER PLATE ORDERING INFORMATION

**Instructions:**
**(1) Select a cover plate base part number**
**(2) Add the suffix for the desired finish**
**(3) Add the suffix for the required cover plate nominal rating.**

**Example:**
**23190MC/W = 165 °F (74 °C) Temperature rated, 2-3/4" (70 mm) diameter, thread-on style, round cover plate with a painted white finish.**

| 1: Select a Cover Plate Base Part Number[3] | | | | | | 2: Select a Finish | |
|---|---|---|---|---|---|---|---|
| Thread-On Style | | | Push-On Style | | | | |
| Base Part Number[1] | Size Inch (mm) | Type | Base Part Number | Size Inch (mm) | Type | Description | Suffix[4] |
| 23190 | 2-3/4 (70) | Round | 23447 | 2-3/4 (70) | Round | Polished Chrome | F |
| 23174 | 3-5/16 (84) | Round | 23463 | 3-5/16 (84) | Round | Brushed Chrome | F-/B |
| 23179 | 3-5/16 (84) | Square | 23482 | 3-5/16 (84) | Square | Bright Brass | B |
| 23193[5] | 2-3/4 (70) | Stainless Steel Round | 23455[5] | 2-3/4 (70) | Stainless Steel Round | Antique Brass | B-/A |
| | | | | | | Brushed Brass | B-/B |
| 23183[5] | 3-5/16 (84) | Stainless Steel Round | 23473[5] | 3-5/16 (84) | Stainless Steel Round | Brushed Copper | E-/B |
| | | | | | | Painted White | M-/W |
| | | | | | | Painted Ivory | M-/I |
| | | | | | | Painted Black | M-/B |

**3: Temperature Rating Matrix[1,2]**

| Cover Plate Nominal Rating (Required) | Temperature Classification | Sprinkler Nominal Rating | Sprinkler Maximum Ambient Ceiling Temperature[2] | Suffix |
|---|---|---|---|---|
| 139 °F (59 °C) | Ordinary | 155 °F (68 °C) | 100 °F (38 °C) | **A** |
| 165 °F (74 °C) | Intermediate | 200 °F (93 °C) | 150 °F (65 °C) | **C** |

**Footnotes**

1. Part number shown is the base part number. For complete part number, refer to the current Viking price list schedule.
2. The sprinkler temperature rating is stamped on the deflector.
3. Based on NFPA-13, NFPA 13R, and NFPA 13D. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
4. Where a dash (-) is shown in the Finish suffix designation, insert the desired Temperature Rating suffix. See example above.
5. Stainless Steel versions are not available with any finishes or paint.

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## Approval Chart
## Viking VK494, 4.9 K-factor Residential Concealed Pendent Sprinkler

**For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the Design Criteria. For Ceiling types refer to current editions of NFPA 13, 13R or 13D**

| Sprinkler Base Part Number [1] | SIN | Thread Size | | | Nominal K-factor | | Maximum Water Working Pressure |
|---|---|---|---|---|---|---|---|
| | | NPT | BSPT | | U.S. | metric [2] | |
| 23707 | VK494 | 1/2" | 15 mm | | 4.9 | 70.6 | 175 psi (12 bar) |

| Max. Coverage Area [6] W X L Ft. X Ft. (m X m) | Flow GPM (LPM) | Pressure PSI (bar) | Deflector to Ceiling | Installation Type | Listings and Approvals[3,5] | Minimum Spacing Ft. (m) |
|---|---|---|---|---|---|---|
| | 155 °F (68 °C), 200 °F (93 °C) Temperature Rated Sprinklers | | | | cULusEU[4] | |
| 12 X 12 (3.7 X 3.7) | 13 (49.2) | 7.0 (0.48) | Refer to Figure 5 | Concealed with Cover Plate Assembly. See Footnote 7. | See Footnotes 8, & 9 | 8 (2.4) |
| 14 X 14 (4.3 X 4.3) | 13 (49.2) | 7.0 (0.48) | | | | |
| 16 X 16 (4.9 X 4.9) | 13 (49.2) | 7.0 (0.48) | | | | |
| 18 X 18 (5.5 X 5.5) | 17 (64.4) | 12.0 (0.83) | | | | |
| 20 X 20 (6.1 X 6.1) | 20 (75.7) | 16.7 (1.15) | | | | |

### Footnotes

1. Part number shown is the base part number. For complete part number, refer to the current Viking 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 chart shows the listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals. Refer also to Design Criteria.
4. Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.
5. Meets New York City requirements, effective July 1, 2008.
6. For areas of coverage smaller than shown, use the "Flow" and "Pressure" for the next larger area listed. Flows and pressures listed are per sprinkler. The distance from sprinklers to walls shall not exceed one-half the sprinkler spacing indicated for the minimum "Flow" and "Pressure" used.
7. Other paint colors are available on request with the same listings as the standard finish colors. Stainless Steel cover plates are not available with any finishes or paint. Listings and approvals apply for any paint manufacturer. Contact Viking for additional information. Custom colors are indicated on a label inside the cover assembly. Refer to Figure 2.
8. Accepted Cover Plate Finishes are: Polished chrome, brushed chrome, bright brass, antique brass, brushed brass, brushed copper, painted white, painted ivory, or painted black [7].
9. cULusEU Listed as corrosion-resistant - Electroless Nickel PTFE (ENT)

## DESIGN CRITERIA

(Also refer to the Approval Chart.)

**UL Listing Requirements (C-UL-US-EU):**

When using Viking Residential Concealed Pendent Sprinkler VK494 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Chart.

For systems designed to NFPA 13: The number of design sprinklers is to be the four contiguous most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in the Approval Chart for NFPA 13D and NFPA 13R applications for each listed area of coverage, **or**
- Calculated based on a minimum discharge of 0.1 gpm/sq. ft. over the "design area" in accordance with sections 9.5.2.1 or 10.2.4.1.2 of the current edition of NFPA 13.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).

**NOTE: Concealed sprinklers must be installed in neutral or negative pressure plenums only.**

**IMPORTANT: Always refer to Bulletin Form No. F_080415 - Best Practices for Residential Sprinkler Handling and Installation. Also refer to 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 and any other similar Authorities Having Jurisdiction, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. Final approval and acceptance of all residential sprinkler installations must be obtained from the Authorities Having Jurisdiction.**

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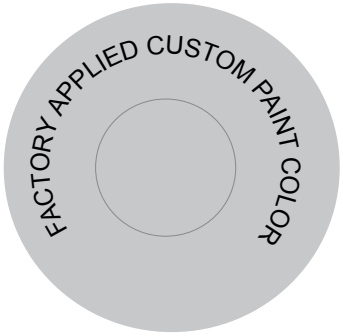
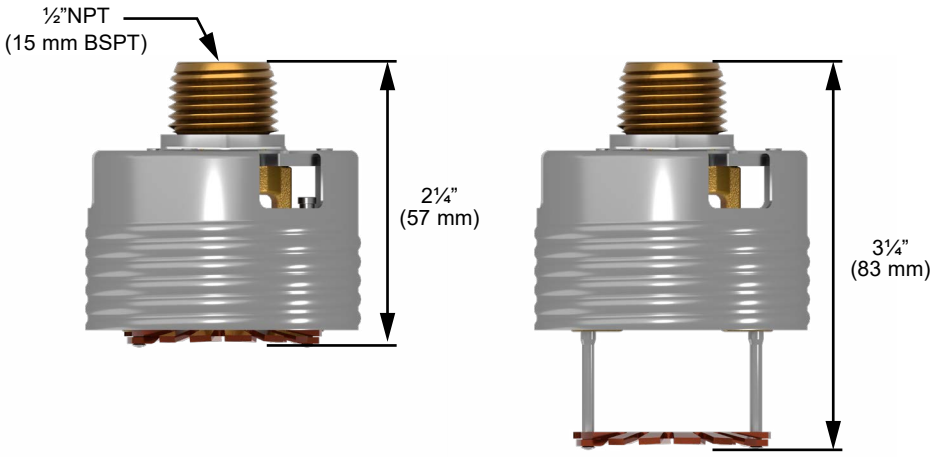



All custom color painted cover plates will have an identifying label affixed to the inside of the cover that indicates the custom color and will have a representative sample (a paint dot) of the paint on the label.

**Figure 2: Identification of Custom Paint**


**Figure 3: Square Cover Assembly**




NOTE: *Image is representative only. Actual product may vary.*

**Figure 4: Sprinkler Dimensions**

| VIKING® | TECHNICAL DATA | FREEDOM® RESIDENTIAL CONCEALED PENDENT SPRINKLER VK494 (K4.9) |
|---|---|---|

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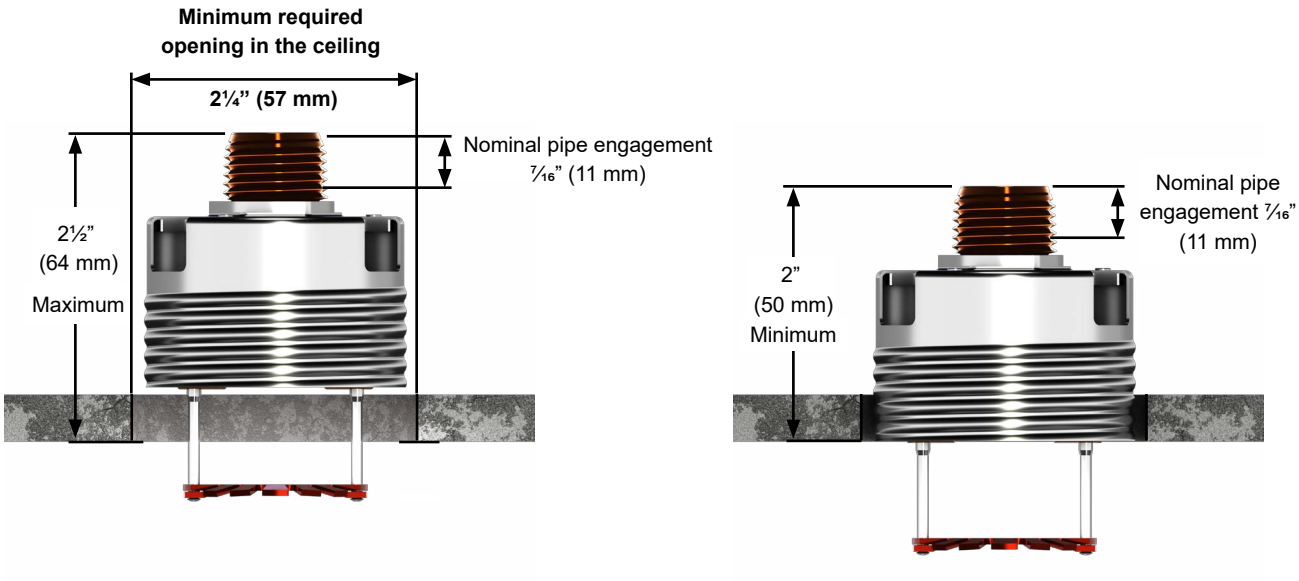


NOTE: *Image is representative only. Actual product may vary.*

**Figure 5: Sprinkler Installation Dimensions**

| VIKING® | TECHNICAL DATA | FREEDOM® RESIDENTIAL CONCEALED PENDENT SPRINKLER VK494 (K4.9) |
|---|---|---|

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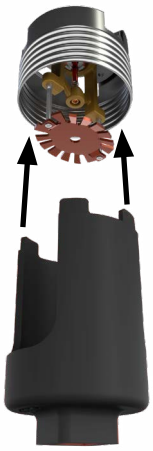
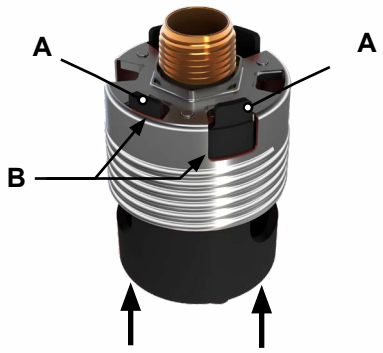
**NOTICE: USE ONLY the designated sprinkler wrenches shown in this document. Permanent damage to the sprinkler assembly can occur if the proper wrench is not used. Other sprinkler wrenches available from Viking may fit into the sprinkler adapter cup; however, only the wrenches shown here are designed to properly install this sprinkler.**

Step 1:
Remove the protective cap.

Step 2:
Insert the wrench into the sprinkler adapter.



Step 3:
Rotate the wrench slightly in either direction until the tines on the wrench (A) line up with the vent openings (B) on the adapter cup and lock into place. NOTE: A leak tight seal must be achieved. Turn the sprinkler clockwise 1 to 1-½ turns past finger-tight.

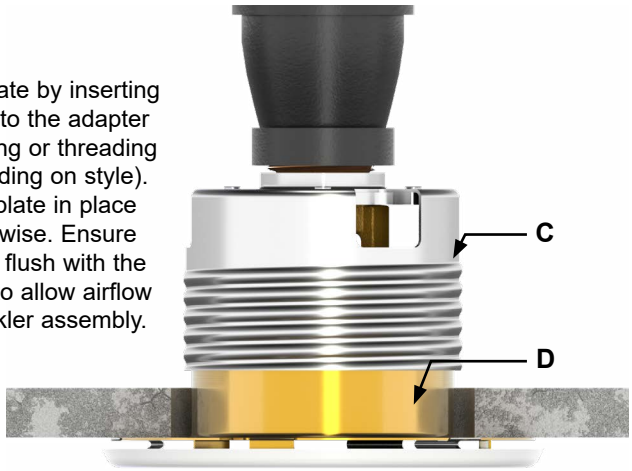



NOTE: *Image is representative only. Actual product may vary.*

**Figure 6: Using the Sprinkler Wrench**

Install the cover plate by inserting the adpater (D) into the adapter cup (C) and pushing or threading into place (depending on style). Snug the cover plate in place by rotating clockwise. Ensure the cover plate is flush with the ceiling as shown to allow airflow through the sprinkler assembly.

**Minimum**




**Maximum**

NOTE: *Image is representative only. Actual product may vary.*

**Figure 7: Installing the Cover Plate**

# TECHNICAL DATA

# FREEDOM® RESIDENTIAL PENDENT SPRINKLER VK468 (K4.9)

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## 1. DESCRIPTION

Viking Freedom® Residential Pendent Sprinkler VK468 is a small, thermosensitive, glass-bulb residential sprinkler available in several different finishes and temperature ratings to meet varying design requirements. The Electroless Nickel PTFE (ENT) coating has been investigated for installation in corrosive atmospheres and is C-UL-US-EU Listed as corrosion resistant as indicated in the Approval Chart. The orifice design, with a K-Factor of 4.9 (70.6 metric†), allows efficient use of available water supplies for the hydraulically designed fire-protection system. The glass bulb operating element and special deflector characteristics meet the challenges of residential sprinkler standards.

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

## 2. LISTINGS AND APPROVALS

**UL Listed (C-UL-US-EU):** Category VKKW

**VdS Approved**

**NYC Approved:** MEA 89-92-E, Volume 35

**UL Classified to:** NSF/ANSI Standard 61, Drinking Water System Components (MH48034).

Refer to the Approval Chart and Design Criteria for C-UL-US-EU Listing requirements that must be followed.

## 3. TECHNICAL DATA

**Specifications:**
Available since 2006.
Minimum Operating Pressure: Refer to the Approval Chart.
Maximum Working Pressure: 175 psi (12 bar). Factory tested hydrostatically to 500 psi (34.5 bar).
Thread size: 1/2” (15 mm) NPT
Nominal K-Factor: 4.9 U.S. (70.6 metric†)
†Metric K-factor measurement shown is 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” (58 mm)

**Material Standards:**
Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Brass UNS-C23000, Phosphor Bronze UNS-C51000, or Brass UNS-C26000
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with Polytetrafluoroethylene (PTFE) Tape
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
Compression Screw: Brass UNS-C36000
For ENT coated sprinklers: Belleville spring - Exposed, Screw and Pipcap - ENT plated.

**Ordering Information:** (Also refer to the current Viking price list.)
**Sprinkler:** Base Part No. 13637
Order Sprinkler VK468 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.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix: 155 °F (68 °C) = B, 175 °F (79 °C) = D
For example, sprinkler VK468 with a Brass finish and a 155 °F (68 °C) temperature rating = Part No. 13637AB.

**Available Finishes And Temperature Ratings:**
Refer to Table 1.

**Accessories:** (Also refer to the Viking website.)

**Sprinkler Wrenches:**
A. Standard Wrench: Part No. 21475M/B (available since 2017)
B. Wrench for recessed sprinklers: Part No. 13577W/B* (available since 2006)
C. Optional Protective Sprinkler Cap Remover/Escutcheon Installer Tool** Part No. 15915 (available since 2010.)
*A ½” ratchet is required (not available from Viking).
**Allows use from the floor by attaching a length of 1” diameter CPVC tubing to the tool. Ideal for sprinkler cabinets. Refer to Bulletin F_051808.

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**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 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 sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

## 6. INSPECTIONS, TESTS AND MAINTENANCE
Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

## 7. AVAILABILITY
The Viking Model VK468 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] | Bulb Color |
|---|---|---|---|
| Ordinary | 155 °F (68 °C) | 100 °F (38 °C) | Red |
| Intermediate | 175 °F (79 °C) | 150 °F (65 °C) | Yellow |

**Sprinkler Finishes:** Brass, Chrome, White Polyester [3], Black Polyester [3], and ENT [3,4]

**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] Sprinklers with ENT, White Polyester, and Black Polyester finishes are C-UL-US-EU Listed as corrosion resistant.

[4] The ENT coating has passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For ENT coated sprinklers, the waterway is coated. Note that the spring is exposed on sprinklers with ENT coating.

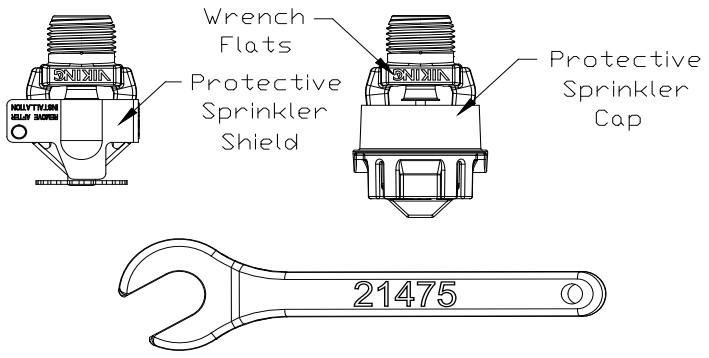


**Figure 1: Standard Sprinkler Wrench 21475M/B**

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## Approval Chart
## Viking VK468, 4.9 K-Factor Residential Pendent Sprinkler

**For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria. For Ceiling types refer to current editions of NFPA 13, 13R or 13D**

| Sprinkler Base Part Number[1] | SIN | NPT Thread Size | | Nominal K-Factor | | Maximum Water Working Pressure | Overall Length | |
|---|---|---|---|---|---|---|---|---|
| | | Inches | mm | U.S. | metric[2] | | Inches | mm |
| 13637 | VK468 | 1/2 | 15 | 4.9 | 70.6 | 175 psi (12 bar) | 2-1/4 | 58 |

| Max. Coverage Area[4] Ft.X Ft. (m X m) | Ordinary Temp Rating (155 °F/68 °C) | | Intermediate Temp Rating (175 °F/79 °C) | | Deflector to Ceiling | Installation Type | Listings and Approvals[3] | | | | Minimum Spacing Ft. (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Flow[4] GPM (L/min) | Pressure[4] PSI (bar) | Flow[4] GPM (L/min) | Pressure[4] PSI (bar) | | | C-UL-US-EU[5] | VdS | NYC[6] | NSF[8] | |
| 12 X 12 (3.7 X 3.7) | 13 (49.2) | 7.0 (0.48) | 13 (49.2) | 7.0 (0.48) | 1-1/8 to 2 inch | Standard surface-mounted escutcheons, or recessed with the Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon | See Foot-notes 7 and 10. | See Foot-notes 7 and 10. | See Foot-note 7. | See Foot-note 7. | 8 (2.4) |
| 14 X 14 (4.3 X 4.3) | 13 (49.2) | 7.0 (0.48) | 13 (49.2) | 7.0 (0.48) | | | | | | | |
| 16 X 16 (4.9 X 4.9) | 13 (49.2) | 7.0 (0.48) | 13 (49.2) | 7.0 (0.48) | | | | | | | |
| 18 X 18 (5.5 X 5.5) | 17 (64.4) | 12.0 (0.83) | 17 (64.4) | 12.0 (0.83) | | | | | | | |
| 20 X 20 (6.1 X 6.1) | 20 (75.7) | 16.7 (1.15) | 20 (75.7) | 16.7 (1.15) | | | | | | | |

**Footnotes**

[1] Part number shown is the base part number. For complete part number, 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 chart shows the listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals. Refer also to Design Criteria.

[4] For areas of coverage smaller than shown, use the "Flow" and "Pressure" for the next larger area listed. Flows and pressures listed are per sprinkler. The distance from sprinklers to walls shall not exceed one-half the sprinkler spacing indicated for the minimum "Flow" and "Pressure" used.

[5] Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.

[6] Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 35.

[7] Approved Finishes are: Brass, Chrome, White Polyester, and Black Polyester[9]

[8] UL Classified to: NSF/ANSI Standard 61, Drinking Water System Components (MH48034).

[9] Other paint colors are available on request with the same C-UL-US-EU listings as the standard finish colors.

[10] Approved finish is Electroless Nickel PTFE (ENT). Sprinklers with ENT, White Polyester, and Black Polyester finishes are C-UL-US-EU Listed as corrosion resistant. ENT is available with standard surface-mounted escutcheons or the Micromatic Model E-1 Recessed Escutcheon.

# TECHNICAL DATA

## FREEDOM® RESIDENTIAL PENDENT SPRINKLER VK468 (K4.9)

**The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058**
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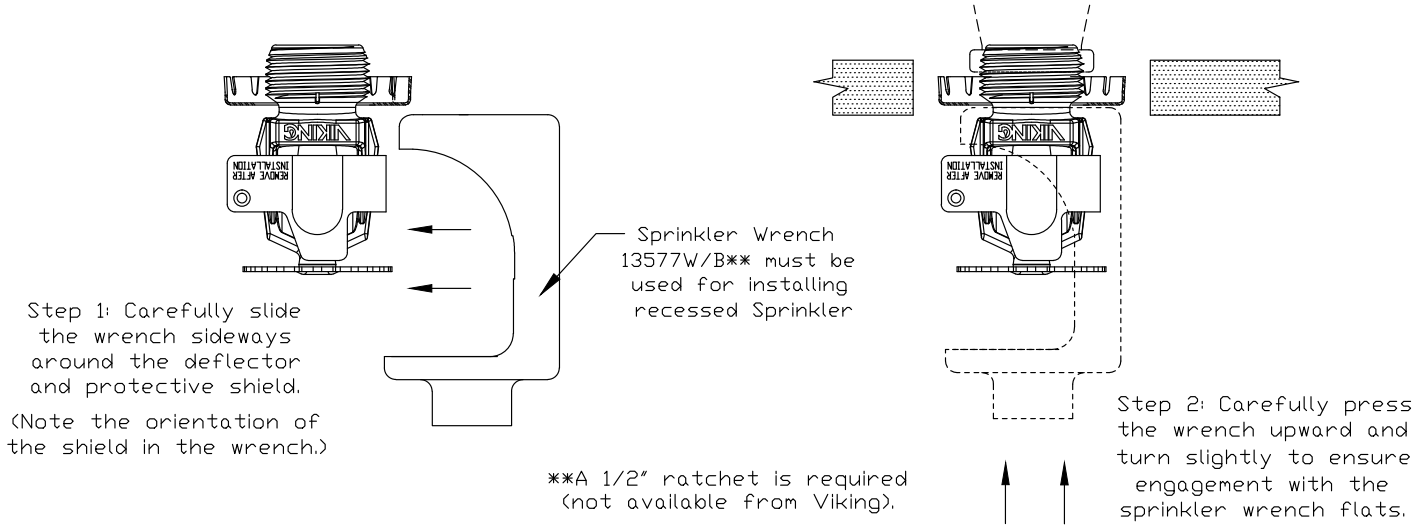


**Figure 2: Wrench 13577W/B for Recessed Sprinkler**

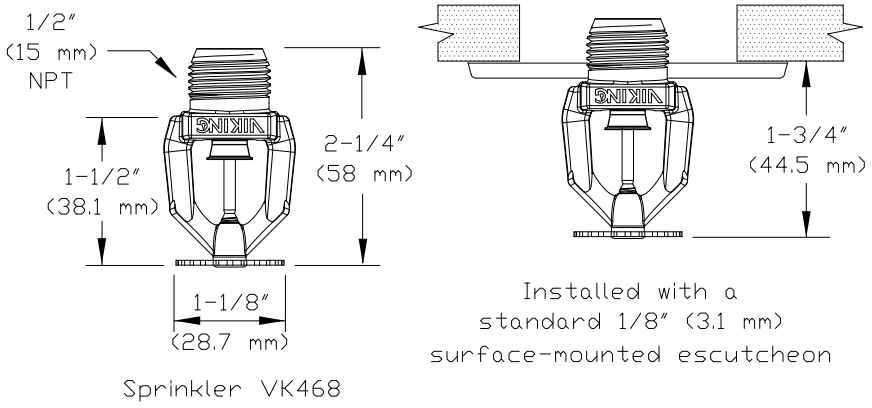


**Figure 3: Sprinkler VK468 Dimensions with a Standard Escutcheon**

| VIKING® | TECHNICAL DATA | FREEDOM® RESIDENTIAL PENDENT SPRINKLER VK468 (K4.9) |
|---|---|---|

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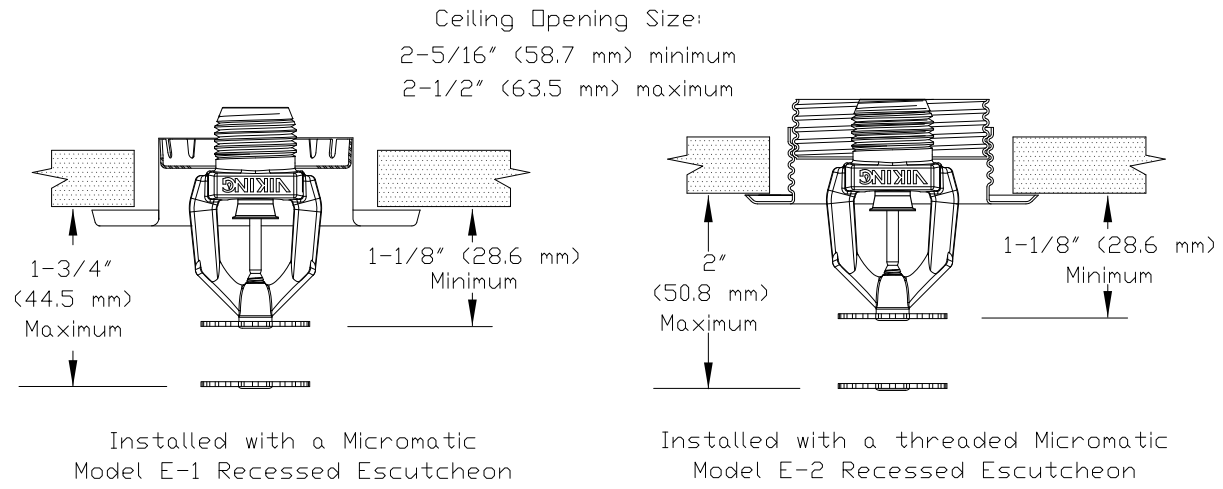


**Figure 4: Sprinkler VK468 Dimensions with the Model E-1 and E-2 Recessed Escutcheons**

## DESIGN CRITERIA

(Also refer to the Approval Chart.)

**UL Listing Requirements (C-UL-US-EU):**

When using Viking Residential Pendent Sprinkler VK468 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Chart.

For systems designed to NFPA 13: The number of design sprinklers is to be the four contiguous most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in the Approval Chart for NFPA 13D and NFPA13R applications for each listed area of coverage, **or**
- Calculated based on a minimum discharge of 0.1 gpm/sq. ft. over the "design area" in accordance with sections 8.5.2.1 or 8.6.2.1.2 of NFPA 13.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).
- Venting is not required.

**IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Form No. F_080614, F_080415 and F_080190 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, VdS, and any other similar Authorities Having Jurisdiction, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. Final approval and acceptance of all residential sprinkler installations must be obtained from the Authorities Having Jurisdiction.**

# Viking Residential Sprinkler Installation Guide

**October 25, 2018**

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

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| VIKING | TECHNICAL DATA | FREEDOM® RESIDENTIAL SPRINKLER INSTALLATION GUIDE |
|---|---|---|

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## 1. DESCRIPTION

Viking residential automatic sprinklers are equipped with a “fast response” heat-sensitive operating element designed to respond individually and quickly to a specific high temperature. Viking residential sprinklers are designed to combine speed of operation with water distribution characteristics to help in the control of residential fires and to improve life safety by prolonging the time available for occupants to escape or be evacuated.

## 2. LISTINGS AND APPROVALS

Refer to the Approval Charts on the appropriate sprinkler technical data page(s) and/or approval agency listings.

A. Viking residential sprinklers are intended for use in the following occupancies: one- and two-family dwellings and mobile homes with the fire protection sprinkler system installed in accordance with NFPA 13D; residential occupancies up to four stories in height with the fire protection system installed in accordance with NFPA 13R; or residential portions of any occupancy with the fire protection system installed in accordance with NFPA 13. Information contained in this guide is based on NFPA 13, “Standard for the Installation of Sprinkler Systems”.

B. The design criteria for residential sprinklers contained in the NFPA installation standards must be followed except as modified by the individual UL 1626 listing information provided in the technical data pages and this Residential Sprinkler Installation Guide. For listed areas of coverage, technical data, and specific design and installation instructions, refer to the appropriate Viking technical data page for the sprinkler model used.

C. Viking residential sprinklers listed by Underwriters Laboratories, Inc. (UL) have passed fire tests designed to represent fire conditions for the sprinkler’s listed area of coverage. The standards for residential sprinkler performance and spray patterns are printed in Underwriters Laboratories Publication UL 1626, “Standard for Residential Sprinklers for Fire Protection Service”. All listed Viking residential sprinklers meet or exceed UL 1626 performance requirements and spray pattern criteria for their listed areas of coverage.

D. NFPA standards allow use of residential sprinklers with rates, design areas, areas of coverage, and minimum design pressures other than those specified in the standards when they have been listed for such specific residential installation conditions.

## 3. TECHNICAL DATA

**Specifications:**

Refer to the appropriate sprinkler technical data sheet.

**Material Standards:**

Refer to the appropriate sprinkler technical data sheet.

**Viking Technical Data may be found on The Viking Corporation’s Web site at http://www.vikinggroupinc.com. The Web site may include a more recent edition of this Technical Data Page.**

## 4. INSTALLATION

**NOTE: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)**

**A. Care and Handling (also refer to Bulletin - Care and Handling of Sprinklers, Form No. F_091699.)**

Sprinklers must be handled with care and protected from mechanical damage during storage, transport, handling, and after installation. Store sprinklers in a cool, dry place in their original container.

Use care when locating sprinklers near fixtures that can generate heat.

Never install sprinklers that have been dropped, damaged in any way, or exposed to temperatures exceeding the maximum ambient temperature allowed (refer to Table 1.)

Never install any glass-bulb sprinkler if the bulb is cracked or if there is a loss of liquid from the bulb. A small air bubble should be present in the glass bulb. Any sprinkler with a loss of liquid from the glass bulb or damage to the fusible element should be destroyed immediately. (Note: Installing glass bulb sprinklers in direct sunlight (ultraviolet light) may affect the color of the dye used to color code the bulb. This color change does not affect the integrity of the bulb.)

Viking residential sprinklers are intended for use on wet pipe residential systems only. Adequate heat must be provided for wet-pipe systems. DO NOT use Viking residential sprinklers on dry systems unless specifically allowed by recognized installation standards or the Authority Having Jurisdiction.

**Residential concealed sprinklers must be installed in neutral or negative pressure plenums only!**

Corrosion-resistant sprinklers must be installed when subject to corrosive atmospheres. **NOTE:** Viking residential sprinklers are not intended for use in corrosive environments.

# TECHNICAL DATA

# FREEDOM® RESIDENTIAL SPRINKLER INSTALLATION GUIDE

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**TABLE 1: RESIDENTIAL SPRINKLER TEMPERATURE RATINGS**

| Sprinkler Temperature Classification | Sprinkler Nominal Temperature Rating[1] | Maximum Ambient Ceiling Temperature[3] | Bulb Color |
|---|---|---|---|
| **Residential Glass Bulb Style Sprinklers** | | | |
| Ordinary | 155 °F (68 °C) | 100 °F (38 °C) | Red |
| Intermediate | 175 °F (79 °C) | 150 °F (65 °C) | Yellow |
| **Sprinkler Temperature Classification** | **Sprinkler Nominal Temperature Rating (Fusing Point)[1]** | **Maximum Ambient Ceiling Temperature[3]** | |
| **Residential Fusible Element Style Sprinklers** | | | |
| Ordinary | 165 °F (74 °C) | 100 °F (38 °C) | |
| **Sprinkler Temperature Classification** | **Sprinkler Nominal Temperature Rating (Fusing Point)** | **Maximum Ambient Ceiling Temperature[3]** | **Temperature Identification Stamp** |
| **Residential Flush Style Sprinklers** | | | |
| Ordinary | 165 °F (74 °C) | 100 °F (38 °C) | On Cover or Sprinkler Inlet (VK476) |
| Intermediate | 220 °F (104 °C) | 150 °F (65 °C) | On Cover |
| **Sprinkler Temperature Classification** | **Sprinkler Nominal Temperature Rating (Fusing Point)** | **Maximum Ambient Ceiling Temperature[3]** | **Cover Plate Temperature Rating** |
| **Residential Concealed Style Sprinklers** | | | |
| Ordinary | 135 °F (57 °C)[1], 140 °F (60 °C)[2], 155 °F (68 °C)[1], or 165 °F (74 °C)[1] | 100 °F (38 °C) | 135 °F (57 °C) |

**Footnotes**

[1] The sprinkler temperature rating is stamped on the deflector or flow shaper.

[2] The temperature rating is stamped on the sprinkler.

[3] 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.

**B. Installation Instructions**

Viking sprinklers are manufactured and tested to meet the rigid requirements of approving agencies. They are designed to be installed in accordance with recognized installation standards NFPA 13, NFPA 13R, and NFPA 13D, and any associated TIAs.

Deviation from the standards or any alteration to the sprinklers or cover plate assemblies after they leave the factory including, but not limited to: painting, plating, coating, or modification, may render the sprinklers inoperative and will automatically nullify the approval and any guarantee made by Viking.

The use of residential sprinklers may be limited due to occupancy and hazard. Residential fire protection systems must be designed and installed only by those who are completely familiar with the appropriate standards and codes, and thoroughly experienced in fire protection design, hydraulic calculations, and sprinkler system installation.

Before installation, be sure to have the appropriate sprinkler model and style, with the correct K-Factor, temperature rating, and response characteristics. Viking residential sprinklers must be installed after the piping is in place to prevent mechanical damage. Keep sprinklers with protective caps or bulb shields contained within the caps or shields during installation and testing, and any time the sprinkler is shipped or handled.

1a. For frame-style sprinklers, install escutcheon (if used), which is designed to thread onto the external threads of the sprinkler*.

*Refer to the appropriate sprinkler technical data page to determine approved escutcheons for use with specific sprinkler models.

1b. For flush and concealed style sprinklers: Cut the sprinkler nipple so that the ½" or 3/4" (15 mm or 20 mm) NPT** outlet of the reducing coupling is at the desired location and centered in the opening** in the ceiling or wall.

**Size depends on the sprinkler model used. Refer to appropriate sprinkler data page.

# TECHNICAL DATA

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## DESIGN CRITERIA

**For Systems Designed to NFPA 13D or NFPA 13R: Apply the listed areas of coverage and minimum water supply requirements shown in the approval charts on the residential sprinkler data pages. The sprinkler flow rate is the minimum required discharge from each of the total number of design sprinklers as specified in NFPA 13D or NFPA 13R.**

**For Systems Designed to the latest edition of NFPA 13: The number of design sprinklers is to be the four most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:**

- **The flow rates given in the approval charts on the data pages for NFPA 13D and NFPA13R for each area of coverage listed, or**
- **Calculated based on a minimum discharge of 0.1 gpm/sq. ft. over the "design area" in accordance with sections 8.5.2.1 or 8.6.2.1.2 of NFPA 13. The greatest dimension of the coverage area cannot be any greater than the maximum areas of coverage shown on the data pages.**

### Flow Rates

All residential sprinklers manufactured on or after July 12, 2002 are listed with a single minimum flow rate. Where rooms have more than one sprinkler, multiple-sprinkler calculations are still required, but the first sprinkler and any additional sprinkler or sprinklers must be calculated flowing at identical minimum flow rates, based on the area of sprinkler coverage, using the minimum flow and pressure listed for the sprinkler model used.

Consult the appropriate standards and the Authorities Having Jurisdiction to determine the number of sprinklers to hydraulically calculate to verify adequate water supply for multiple-sprinkler operation.

Operating Pressure: The minimum operating pressure of any sprinkler shall be the minimum operating pressure specified by the listing, or 7 psi (0.5 bar), whichever is greater. The maximum allowable operating pressure is 175 psi (12 bar).

### Areas of Coverage

If the actual area of coverage is less than the listed area of coverage, use the minimum water supply for the next larger area of coverage listed. DO NOT interpolate. Residential sprinkler systems must be hydraulically calculated according to NFPA standards to verify that the water supply is adequate for proper operation of the sprinklers. Hydraulic calculations are required to verify adequate water supply at the hydraulically most remote single sprinkler when it is operating at the minimum gpm and psi listed for single-sprinkler operation for the sprinkler model used.

Viking residential sprinklers may be listed for more than one area of coverage. Suggested practice in selecting area of coverage is to select the one that can be adequately supplied by the available water supply and still allow for the installation of as few sprinklers in a compartment as possible while observing all guidelines pertaining to obstructions and spacing. This maximizes the use of the available water supply, which is often limited on residential fire protection systems. After selecting an appropriate area of coverage, sprinklers must be spaced according to guidelines set forth in the installation standards.

**Definition of "COMPARTMENT":** A space completely enclosed by walls and a ceiling. Openings to an adjoining space are allowed, provided the openings have a minimum lintel depth of 8 in. (203.2 mm) from the ceiling.

### Spacing Guidelines

For guidelines concerning spacing of Viking residential sprinklers near beams, obstructions, heat sources, and sloped ceilings [slopes more than a 2/12 (9.5°) pitch], refer to the Viking residential sprinkler data pages and installation guide, the appropriate NFPA standard, and the Authority Having Jurisdiction. NOTE: Sloped, beamed, and pitched ceilings could require special design features such as larger flow, or a design for more sprinklers to operate in the compartment, or both.

**Distance from Walls:** Install not more than one-half the listed sprinkler spacing nor less than 4" (102 mm) from walls, partitions, or obstructions as defined in the standards.

**Minimum Sprinkler Spacing:** The minimum distance between residential sprinklers to prevent cold soldering (i.e., the spray from one operating sprinkler onto an adjacent sprinkler that could prevent its proper activation) is 8 ft. (2.4 m).

**Maximum Sprinkler Spacing:** Locate adjacent sprinklers no farther apart than the listed spacing.

**Deflector Position:** Install frame style residential *pendent* sprinklers with the deflector between 1" and 4" (25.4 mm to 102 mm) below smooth ceilings, unless the sprinkler data page indicates otherwise. Install pendent sprinklers in the pendent position only, with the deflector oriented parallel with the ceiling or roof.

Refer to the individual listings in the residential sprinkler data pages for horizontal sidewall sprinkler deflector or sprinkler centerline distance below the ceiling. Install horizontal sidewall sprinklers in the horizontal position only below smooth ceilings, with the leading edge of the deflector or element assembly oriented parallel with the ceiling.

**IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to the appropriate sprinkler data page. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA and any other similar Authorities Having Jurisdiction, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. Final approval and acceptance of all residential sprinkler installations must be obtained from the Authorities Having Jurisdiction.**

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2. Apply a small amount of pipe-joint compound or tape to the external threads of the sprinkler only, taking care not to allow a build-up of compound in the sprinkler inlet. **NOTE:** Sprinklers with protective caps or bulb shields must be contained within the caps or shields before applying pipe-joint compound or tape. *Exception: For concealed sprinklers (i.e., VK457, VK458, VK468, VK474, and VK4570) the protective cap is removed for installation.*
3. Care must be taken when installing sprinklers on CPVC and copper piping systems. Never install the sprinkler into the reducing fitting before attaching the reducing fitting to the piping. Sprinklers must be installed on CPVC systems after the reducing fitting has been installed and the primer and/or cement manufacturer's recommended curing time has elapsed. When installing sprinklers on copper piping systems, take care to brush the inside of the sprinkler supply piping and reducing fitting to ensure that no flux accumulates in the sprinkler orifice. Excess flux can cause corrosion and may impair the ability of the sprinkler to operate properly.
4. Refer to the appropriate sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used. DO NOT use the sprinkler deflector or fusible element to start or thread the sprinkler into a fitting.
   a. Install the sprinkler onto the piping using the special sprinkler wrench only, while taking care not to over-tighten or damage the sprinkler operating parts.
   *b. Thread the flush or concealed sprinkler into the ½*" or 3/4" (15 mm or 20 mm) NPT** *outlet of the coupling by turning it clockwise with the special sprinkler wrench. NOTE: For flush and concealed sprinklers with protective shells, the internal diameter of the special flush and concealed sprinkler installation wrench is designed for use with the sprinkler contained within the shell. Exception: For concealed sprinklers VK457, VK458, VK468, VK474, and VK4570 the protective cap is removed for installation, and then placed back on the sprinkler temporarily.*
5. After installation, the entire sprinkler system must be tested. The test must be conducted to comply with the installation standards.
   a. Make sure the sprinkler has been properly tightened. If a thread leak occurs, normally the unit must be removed, new pipe-joint compound or tape applied, and then reinstalled. This is due to the fact that when the joint seal leaks, the sealing compound is washed out of the joint.
   b. **Remove plastic protective sprinkler caps or bulb shields AFTER 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.** To remove the bulb shields, simply pull the ends of the shields apart where they are snapped together. To remove caps from frame style sprinklers, turn the caps slightly and pull them off the sprinklers. **SPRINKLER CAPS OR BULB SHIELDS MUST BE REMOVED FROM SPRINKLERS <u>BEFORE</u> PLACING THE SYSTEM IN SERVICE!** Retain a protective cap or shield in the spare sprinkler cabinet.
6. For residential flush sprinklers, the ceiling ring can now be installed onto the sprinkler body. Align the ceiling ring with the sprinkler body and thread on or push it on until the flange touches the ceiling. Note the maximum vertical adjustment is ½" (12,7 mm) for sprinkler VK420 and 5/8" for VK476. DO NOT MODIFY THE UNIT. If necessary, re-cut the sprinkler drop nipples as required.
7. For residential concealed sprinklers, the cover plate assembly can now be attached.
   a. Remove the cover plate assembly from the protective box, taking care not to damage the assembly.
   b. From below the ceiling, gently place the base of the cover plate assembly over the sprinkler protruding through the opening in the ceiling or wall.
   c. Carefully push the cover plate assembly onto the sprinkler, using even pressure with the palm of the hand, until the unfinished brass flange of the cover plate base touches the ceiling or wall.
   d. The maximum adjustment available for residential concealed sprinklers is ½" (12.7 mm) [1/4" (6.4 mm) for sprinkler VK480]. DO NOT MODIFY THE UNIT. If necessary, re-cut the sprinkler nipples.

**NOTE:** If it is necessary to remove the entire sprinkler unit, the system must be taken out of service. See Maintenance instructions below and follow all warnings and instructions.

## 5. OPERATION

During fire conditions, the operating element fuses or shatters (depending on the type of sprinkler), releasing the pip cap and sealing assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector or flow shaper, forming a uniform, high-wall wetting spray pattern to extinguish or control the fire.

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## 6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements. **NOTICE:** The owner is responsible for having the fire-protection system and devices inspected, tested, and maintained in proper operating condition in accordance with this guide, and applicable NFPA standards. In addition, the Authority Having Jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

A. Sprinklers must be inspected on a regular basis for signs of corrosion, mechanical damage, obstructions, paint, etc. Frequency of the inspections may vary due to corrosive atmospheres, water supplies, and activity around the device.

B. Sprinklers or cover plate assemblies that have been field painted, caulked, or mechanically damaged must be replaced immediately. Sprinklers showing signs of corrosion shall be tested and/or replaced immediately as required. Installation standards require sprinklers to be tested and, if necessary, replaced immediately after a specified term of service. Refer to NFPA 25 and the Authorities Having Jurisdiction for the specified period of time after which testing and/or replacement of residential sprinklers is required. Never attempt to repair or reassemble a sprinkler. Sprinklers and cover assemblies that have operated cannot be reassembled or re-used, but must be replaced. When replacement is necessary, use only new sprinklers and cover assemblies with identical performance characteristics.

C. The sprinkler discharge pattern is critical for proper fire protection. Nothing should be hung from, attached to, or otherwise obstruct the discharge pattern of the sprinkler. All obstructions must be immediately removed or, if necessary, additional sprinklers installed.

D. When replacing existing sprinklers, the system must be removed from service. Refer to the appropriate system description and/or valve instructions. Prior to removing the system from service, notify all Authorities Having Jurisdiction. Consideration should be given to employment of a fire patrol in the effected area.

1. Remove the system from service, drain all water, and relieve all pressure on the piping.

2a. For frame-style sprinklers, use the special sprinkler wrench and remove the old sprinkler by turning it counterclockwise to unthread it from the piping.

*2b. For residential flush pendent and concealed style sprinklers: Remove the ceiling ring or cover plate assembly before unthreading the sprinkler body from the piping. To remove a ceiling ring, grasp it from below the ceiling and gently turn it counterclockwise. Cover plates can be removed either by gently unthreading them or pulling them off the sprinkler body (depends on the sprinkler model used). After the ceiling ring or cover plate assembly has been removed from the sprinkler, use the sprinkler wrench to unthread the sprinkler from the piping. NOTE: For flush and concealed sprinklers with protective shells, the internal diameter of the special flush and concealed sprinkler installation wrench is designed for use with the sprinkler contained within the shell. Place a plastic protective shell (from the spare sprinkler cabinet) over the sprinkler to be removed and then fit the sprinkler wrench over the shell. Exception: Concealed sprinklers VK457, VK458, VK468, VK474, and VK4570 are removed without the plastic cap.*

3. Follow instructions in section 4B. Installation Instructions to install the new unit. Be sure the replacement sprinkler is the correct model and style, with the appropriate K-Factor, temperature rating, and response characteristics. A fully stocked sprinkler cabinet should be provided for this purpose. *(For flush or concealed style sprinklers, stock of spare ceiling rings or cover plates should also be available in the spare sprinkler cabinet.)*

4. Place the system back in service and secure all valves. Check for and repair all leaks.

E. Sprinkler systems that have been subjected to a fire must be returned to service as soon as possible. The entire system must be inspected for damage, and repaired or replaced as necessary. Sprinklers that have been exposed to corrosive products of combustion or high ambient temperatures, but have not operated, should be replaced. Refer to the Authority Having Jurisdiction for minimum replacement requirements.

## 7. AVAILABILITY

Viking Residential Sprinklers are available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

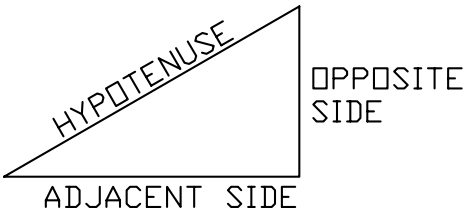
## 8. GUARANTEE

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

**TECHNICAL DATA**

# FREEDOM® RESIDENTIAL SPRINKLER INSTALLATION GUIDE

**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**

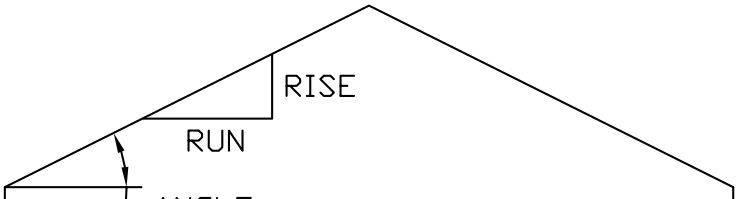



TANGENT =
OPPOSITE SIDE (RISE)
ADJACENT SIDE (RUN)

$$\frac{\text{RISE}}{\text{RUN}} = \text{TANGENT}$$

$$\text{ANGLE} = \text{TAN}^{-1}\left(\frac{\text{RISE}}{\text{RUN}}\right)$$

$$\text{SLOPE DISTANCE} = \sqrt{(\text{RISE})^2 + (\text{RUN})^2}$$




| RISE | RUN | TANGENT | ANGLE | SLOPE DISTANCE |
|---|---|---|---|---|
| 2 | 12 | .1666 | 9.45° | 12.1 |
| 3 | 12 | .2500 | 14° | 12.3 |
| 4 | 12 | .3333 | 18.4° | 12.6 |
| 5 | 12 | .4166 | 22.6° | 13 |
| 6 | 12 | .5000 | 26.5° | 13.4 |
| 7 | 12 | .5833 | 30.2° | 13.8 |
| 8 | 12 | .6666 | 33.6° | 14.4 |
| 9 | 12 | .7500 | 36.8° | 15 |
| 10 | 12 | .8333 | 39.8° | 15.6 |
| 11 | 12 | .9166 | 42.5° | 16.2 |
| 12 | 12 | 1 | 45° | 16.97 |

**Table 2**
Rise Over Run Conversion to Degrees of Slope

# TECHNICAL DATA

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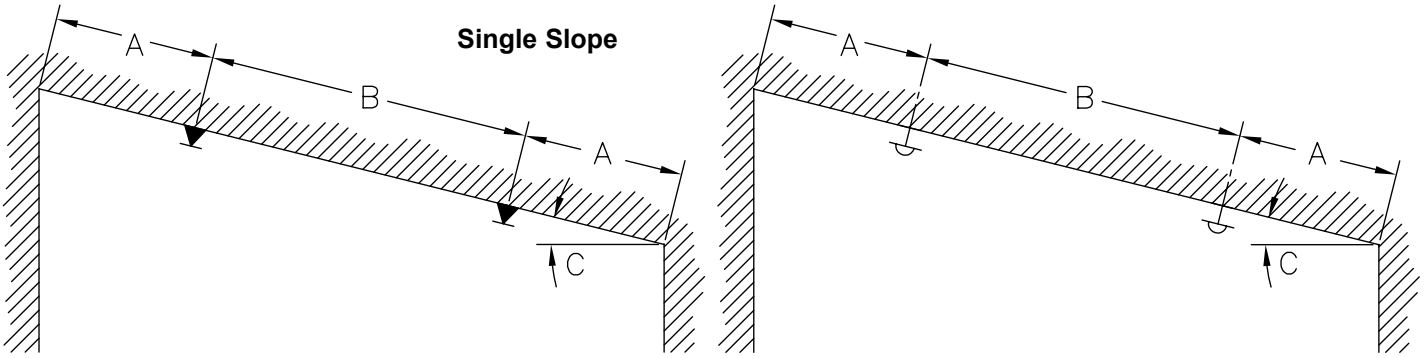
## SPACING OF RESIDENTIAL SPRINKLERS LISTED FOR USE BELOW SLOPED CEILINGS UP TO AN 8/12 (33.7°) PITCH

(Refer to the appropriate residential sprinkler technical data page for listings.)




**Pendent Sprinklers**

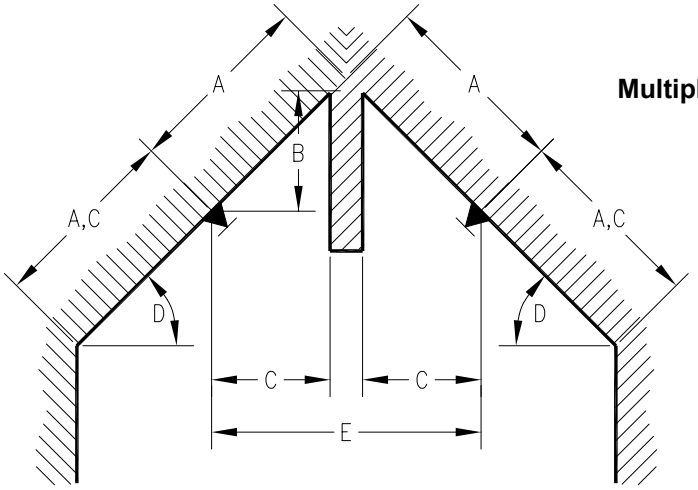
**Horizontal Sidewall Sprinklers (Spray Across the Slope)**

**Figure 1**

(A) One-half listed spacing of sprinkler maximum, 0'-4" (0-102 mm) minimum.
(B) Listed spacing of sprinkler, maximum, 8'-0" (2.4 m) minimum.
(C) Where angle "C" is greater than an 8/12 (33.7°) pitch, see Figure 2 below.

## SPACING OF RESIDENTIAL SPRINKLERS BELOW SLOPED CEILINGS WITH GREATER THAN 8/12 (33.7°) PITCH

(NOTE: Refer to NFPA 13D or NFPA 13R, and the Authority Having Jurisdiction.)




**Multiple Slope**

**Figure 2**

(A) One-half listed spacing of sprinkler, maximum.
(B) 3'-0" (.91 m) maximum.
(C) 0'-4" (0-102 mm) minimum.
(D) Slopes greater than an 8/12 (33.7°) pitch.
(E) For distance less than 8'-0" (2.4 m), baffle required.

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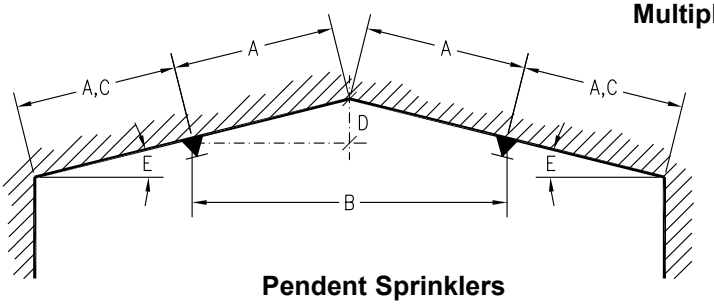
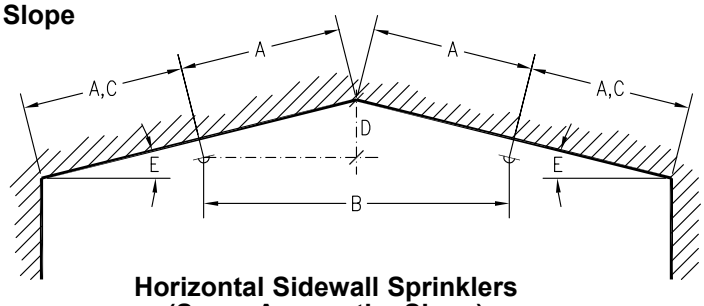
## SPACING OF RESIDENTIAL SPRINKLERS LISTED FOR USE BELOW SLOPED CEILINGS UP TO AN 8/12 (33.7°) PITCH

(Refer to the appropriate residential sprinkler technical data page for listings.)

**Multiple Slope**




**Pendent Sprinklers**




**Horizontal Sidewall Sprinklers (Spray Across the Slope)**

**Figure 3**

(A) One-half listed spacing of sprinkler, maximum.
(B) 8’-0” (2.4 m) minimum.
(C) 0’-4” (0-102 mm) minimum.
(D) 3’-0” (.91 m) maximum.
(E) Acceptable for slopes of 0/12 to 8/12 (0° to 33.7°) pitch.

## SPACING OF RESIDENTIAL PENDENT SPRINKLERS AT PEAK OF SLOPED CEILINGS WITH PITCH LESS THAN 8/12 (33.7°)

(Refer to the appropriate residential sprinkler technical data page for listings.)

**Multiple Slope**

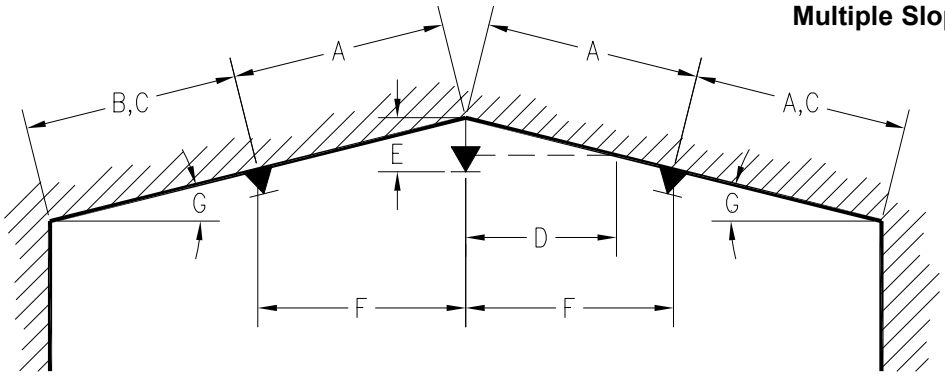



**Figure 4**

(A) Listed spacing of sprinkler, maximum.
(B) One-half listed spacing of sprinkler, maximum.
(C) 0’-4” minimum.
(D) Refer to page 10 for minimum distance between sprinkler and intersecting sloped ceiling.
(E) Refer to the appropriate residential sprinkler technical data page for deflector distance below ceiling.
(F) 8’-0” minimum.
(G) Reference: 4/12 (18.0°) pitch maximum for 12’ (3.7 m) spacing.
2.5/12 (12.0°) pitch maximum for 14’ (4.3 m) spacing.
2/12 (10.0°) pitch maximum for 16’ (4.9 m) spacing.
2/12 (10.0°) pitch maximum for 18’ (5.5 m) spacing.
1.9/12 (9.0°) pitch maximum for 20’ (6.1 m) spacing.
Angles based on sprinklers installed 0’-4” (0-102 mm) from peak.

**NOTE:** Whenever possible, utilize design as shown in Figure 3 above.

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## SPACING OF RESIDENTIAL SPRINKLERS BELOW SLOPED CEILINGS WITH GREATER THAN 8/12 (33.7°) PITCH WITH NO BAFFLE AND A MAXIMUM OF 2 SPRINKLERS IN THE ROOM

(NOTE: Refer to NFPA 13D or NFPA 13R, and the Authority Having Jurisdiction.)

**Multiple Slope**

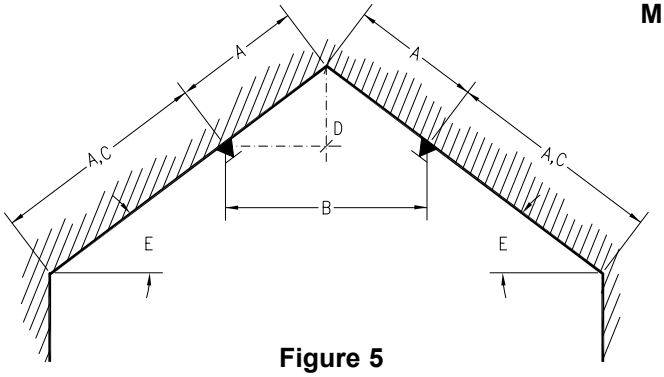


**Figure 5**

(A) One-half listed spacing of sprinkler, maximum.

(B) 8’-0” (2.4 m) minimum.

(C) 0’-4” (0-102 mm) minimum.

(D) 3’-0” (.91 m) maximum.

(E) Acceptable for slopes greater than an 8/12 (33.7°) pitch.

(F) When this design is used, refer to the appendices of NFPA 13D or NFPA 13R, and the Authority Having Jurisdiction regarding the number of design sprinklers to hydraulically calculate.

## SPACING OF RESIDENTIAL SPRINKLERS BELOW CEILINGS WITH SLOPES EXCEEDING 8/12 (33.7°) PITCH WITH NO BAFFLE AND A MAXIMUM OF 3 SPRINKLERS IN THE ROOM

(NOTE: Refer to NFPA 13D or NFPA 13R, and the Authority Having Jurisdiction.)

**Multiple Slope**

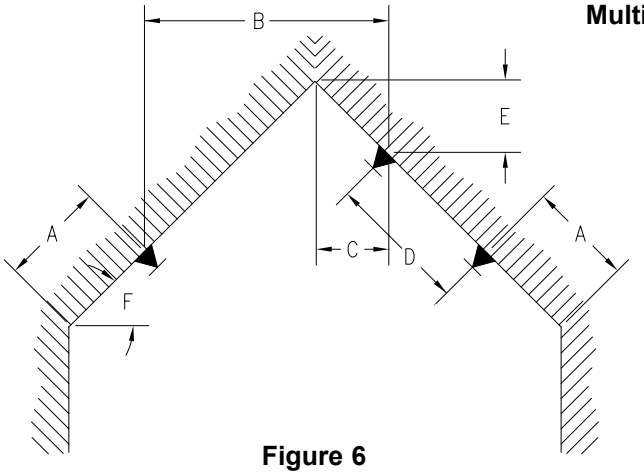


**Figure 6**

(A) 0’-4” (0-102 mm) minimum, to one-half listed spacing, maximum.

(B) One-half listed spacing, maximum, 8’-0” (2.4 m) minimum.

(C) 0’-4” (0-102 mm) minimum.

(D) Listed spacing maximum, 8’-0” (2.4 m) minimum.

(E) 3’-0” (.91 m) maximum.

(F) Slopes greater than 8/12 up to a 21/12 (33.7° up to 60°) pitch.

**NOTES:** In addition to the above limits, rooms requiring this type of installation must be hydraulically calculated to supply a minimum of three operating sprinklers. Layout similar for horizontal sidewall sprinklers with throw across slope. Refer to the appropriate residential sprinkler technical data sheets.

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## SPACING OF RESIDENTIAL SPRINKLERS BELOW CEILINGS WITH SLOPES EXCEEDING 8/12 (33.7°) PITCH WITH NO BAFFLE AND A MAXIMUM OF 2 SPRINKLERS IN THE ROOM

(NOTE: Refer to NFPA 13D or NFPA 13R, and the Authority Having Jurisdiction.)

**Multiple Slope**

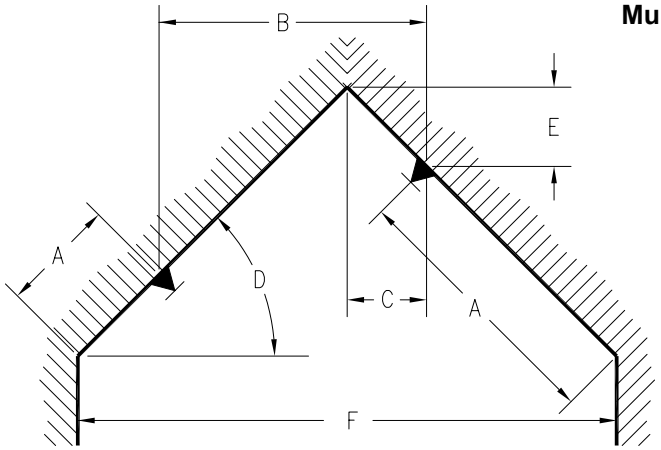



**Figure 7**

(A) 0'-4" (0-102 mm) minimum, to one-half listed spacing, maximum.

(B) One-half listed spacing, maximum, 8'-0" (2.4 m) minimum.

(C) 0'-4" (0-102 mm) minimum.

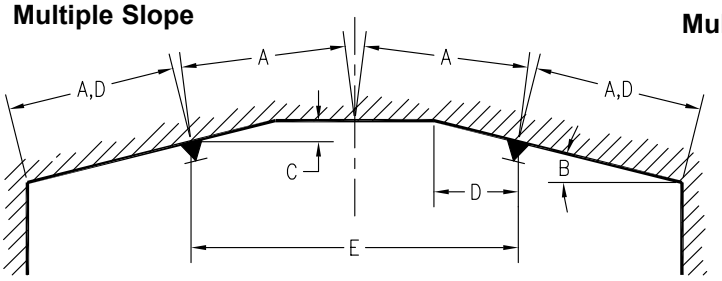
(D) Slopes greater than 8/12 pitch up to a 21/12 (33.7° up to a 60°) pitch.

(E) 3'-0" (.91 m) maximum.

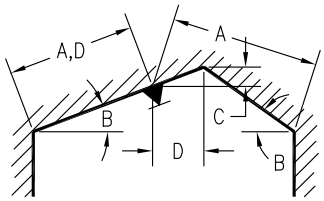
(F) When dimension "F" exceeds 16' (4.9 m), utilize design configuration shown in Figure 6.

**NOTES:** Layout similar for horizontal sidewall sprinklers with throw across slope. Refer to the appropriate residential sprinkler technical data sheets.

**Multiple Slope**




**Multiple Slope**




**Single Slope**

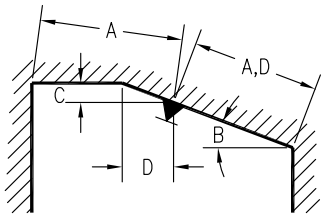



**Figure 8**

(A) One-half listed spacing, maximum.

(B) Refer to the appropriate residential sprinkler technical data pages for listings of sprinklers for use below slopes up to and including a 8/12 (33.7°) pitch.

(C) 3'-0" (.91 m) maximum.

(D) 0'-4" (0-102 mm) minimum.

(E) 8'-0" (2.4 m) minimum without baffle.

**NOTES:** Layout similar for horizontal sidewall sprinklers with throw across slope. Refer to the appropriate residential sprinkler technical data sheets.

# TECHNICAL DATA

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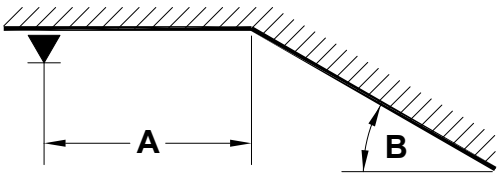
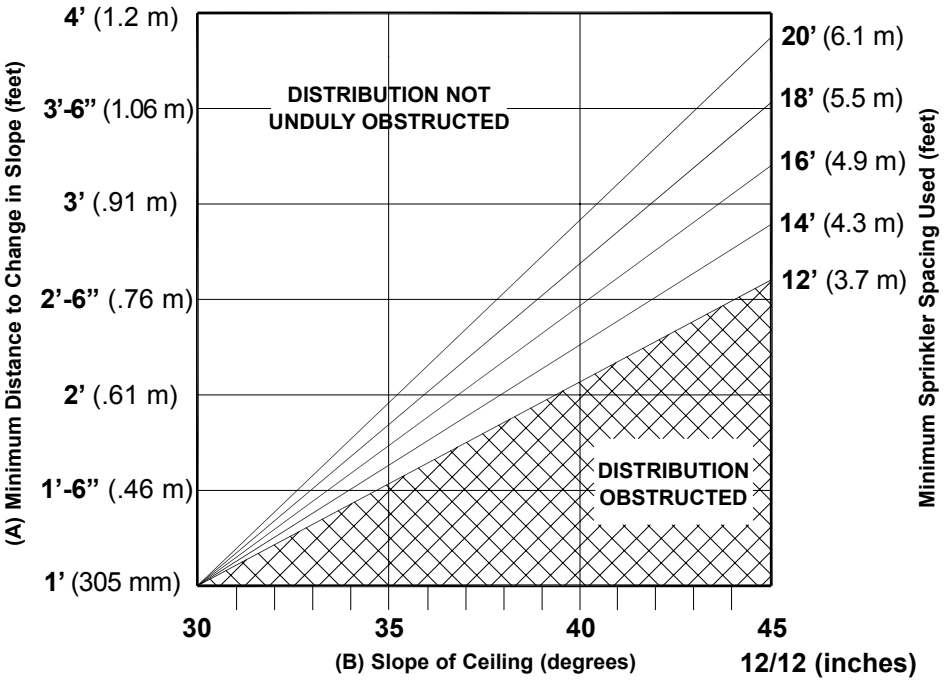
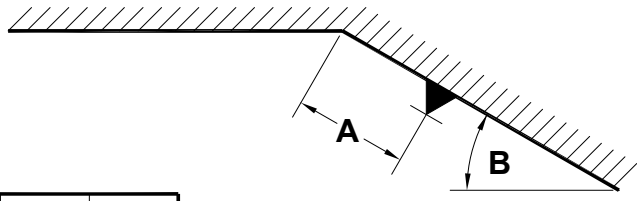
## MINIMUM DISTANCE BETWEEN SPRINKLER AND INTERSECTING SLOPED CEILINGS

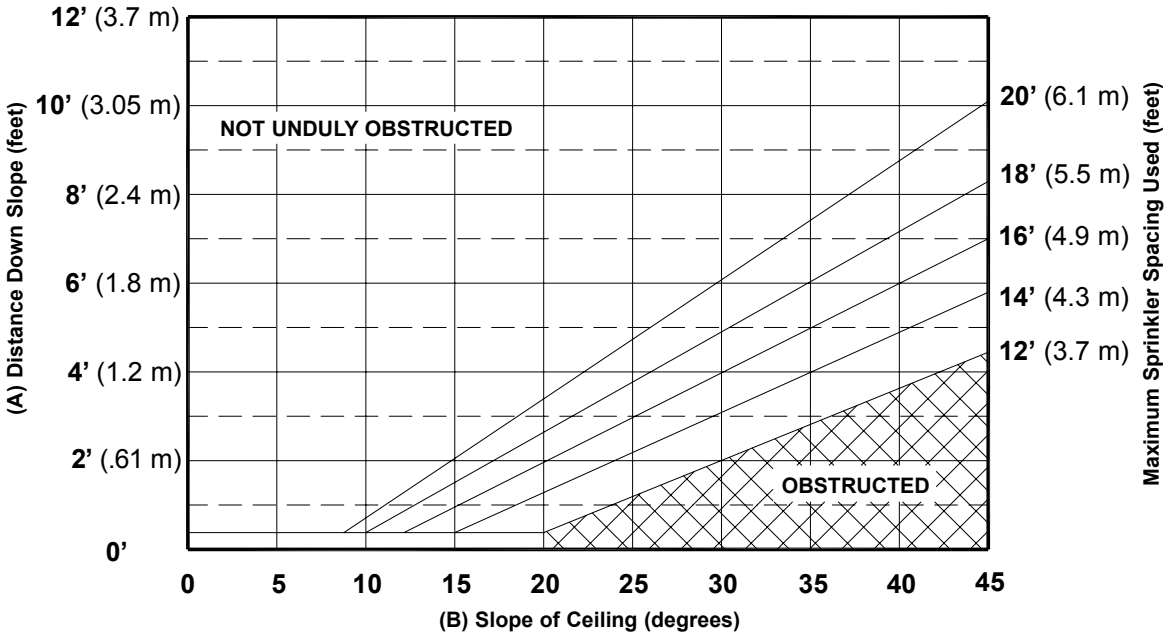



**NOTES:** For any ceiling slope under 7/12 (30°), distribution is considered Not Unduly Obstructed.




## MAXIMUM DISTANCE DOWN SLOPE TO AVOID OBSTRUCTION TO SPRINKLER DISCHARGE



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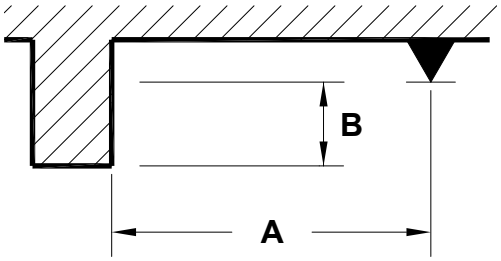
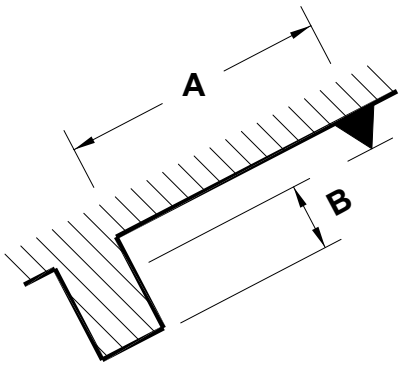
## AVOIDING OBSTRUCTIONS TO SPRINKLER DISCHARGE

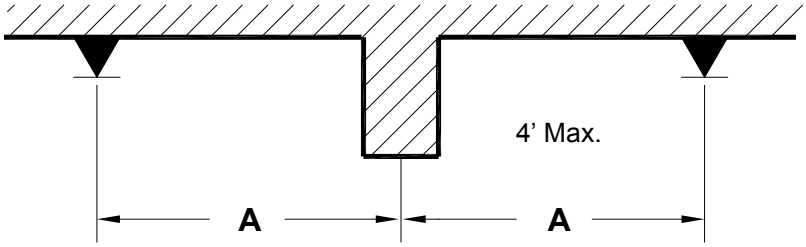
(Obstruction rules for residential sprinklers are found in section 8.10 of the 2010 edition of NFPA 13.)

### Positioning Residential Pendent Sprinklers - Obstructions at the Ceiling



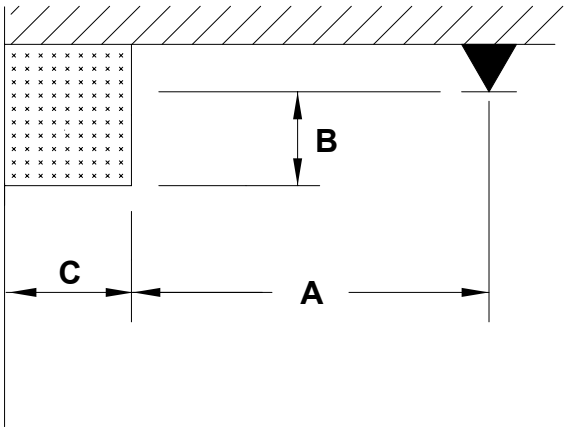




| Distance from Sprinkler to Side of Ceiling Obstruction (Dimension A) | Maximum Distance from Deflector to Bottom of Ceiling Obstruction (Dimension B) | |
|---|---|---|
| | Inches | mm |
| Less than 1 ft. 6 in. (Less than 457 mm) | 0 | 0 |
| 1 ft. 6 in. to less than 3 ft. (457 mm to less than .94 m) | 1 | 25.4 |
| 3 ft. to less than 4 ft. (.91 m to less than 1.2 m) | 3 | 76 |
| 4 ft. to less than 4 ft. 6 in. (1.2 m to less than 1.37 m) | 5 | 127 |
| 4 ft. 6 in. to less than 6 ft. (1.37 m to less than 1.8 m) | 7 | 178 |
| 6 ft. to less than 6 ft. 6 in. (1.8 m to less than 2 m) | 9 | 229 |
| 6 ft. 6 in. to less than 7 ft. (2 m to less than 2.1 m) | 11 | 279 |
| 7 ft. or greater (2.1 m or greater) | 14 | 356 |




Residential pendent sprinklers may be located on opposite sides of continuous obstructions up to 4 ft. (1.2 m) wide at the ceiling, as long as the distance from the centerline of the obstruction to the sprinklers (A) does not exceed one-half the maximum spacing allowed between sprinklers.

### Positioning Residential Pendent Sprinklers - Obstructions Along Walls




(A) Distance from centerline of sprinkler to side of obstruction.
(B) Distance from deflector to bottom of obstruction.
(C) Width of the obstruction.

Obstructions up to 30 in. (.8 m) wide (C) located against the wall are permitted to be protected when (A) is greater than or equal to (C) minus 8 in. (.2 m) plus (B).

$C \leq 30$ in. $\quad A \geq (C - 8 \text{ in.}) + B$

for metric $C \leq .8$ m $\quad A \geq (C - .2 \text{ m}) + B$

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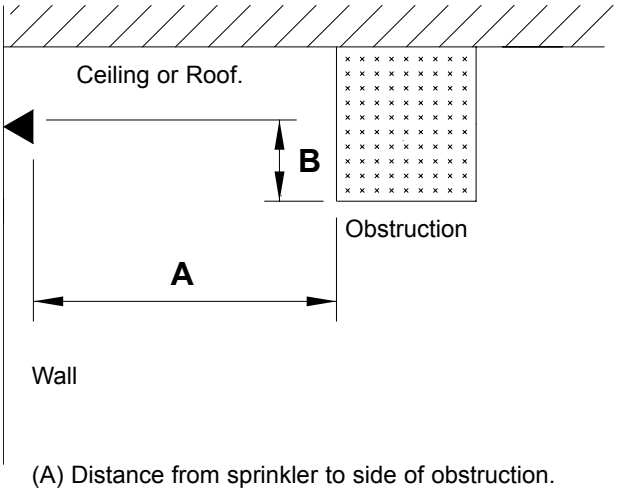
## AVOIDING OBSTRUCTIONS TO SPRINKLER DISCHARGE

(Obstruction rules for residential sprinklers are found in section 8.10 of the 2010 edition of NFPA 13.)

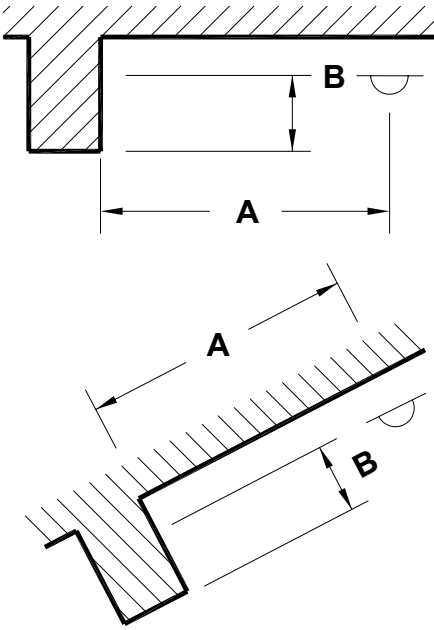
### Positioning Residential Horizontal Sidewall Sprinklers - Obstructions at the Ceiling




(A) Distance from sprinkler to side of obstruction.
(B) Distance from deflector to bottom of obstruction.

| Distance from Sprinkler to Side of Ceiling Obstruction (Dimension A) | Maximum Distance from Deflector to Bottom of Ceiling Obstruction (Dimension B) | |
|---|---|---|
| | Inches | mm |
| Less than 8 ft. (Less than 2.4 m) | No Obstructions Allowed | |
| 8 ft. to less than 10 ft. (2.4 m to less than 3.05 m) | 1 | 25.4 |
| 10 ft. to less than 11 ft. (3.05 m to less than 3.35 m) | 2 | 50.8 |
| 11 ft. to less than 12 ft. (3.35 m to less than 3.7 m) | 3 | 76 |
| 12 ft. to less than 13 ft. (3.7 m to less than 4 m) | 4 | 102 |
| 13 ft. to less than 14 ft. (4 m to less than 4.3 m) | 6 | 152 |
| 14 ft. to less than 15 ft. (4.3 m to less than 4.6 m) | 7 | 178 |
| 15 ft. to less than 16 ft. (4.6 m to less than 4.9 m) | 9 | 229 |
| 16 ft. to less than 17 ft. (4.9 m to less than 5.2 m) | 11 | 279 |
| 17 ft. or greater (5.2 m or greater) | 14 | 356 |

### Positioning Residential Horizontal Sidewall Sprinklers - Obstructions Along Walls




| Distance from Sprinkler to Side of Obstruction Along Wall (Dimension A) | Maximum Distance from Deflector to Bottom of Obstruction (Dimension B) | |
|---|---|---|
| | Inches | mm |
| Less than 1 ft. 6 in. (Less than 457 mm) | 0 | 0 |
| 1 ft. 6 in. to less than 3 ft. (457 mm to less than .94 m) | 1 | 25.4 |
| 3 ft. to less than 4 ft. (.91 m to less than 1.2 m) | 3 | 76 |
| 4 ft. to less than 4 ft. 6 in. (1.2 m to less than 1.37 m) | 5 | 127 |
| 4 ft. 6 in. to less than 6 ft. (1.37 m to less than 1.8 m) | 7 | 178 |
| 6 ft. to less than 6 ft. 6 in. (1.8 m to less than 2 m) | 9 | 229 |
| 6 ft. 6 in. to less than 7 ft. (2 m to less than 2.1 m) | 11 | 279 |
| 7 ft. or greater (2.1 m or greater) | 14 | 356 |

(A) Distance from sprinkler to side of obstruction.
(B) Distance from deflector to bottom of obstruction.

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## LOCATING RESIDENTIAL SPRINKLERS NEAR HEAT SOURCES

Ordinary temperature rated residential sprinklers (135 °F to 170 °F rated) are only to be installed where the maximum ambient ceiling temperature will not exceed 100 °F. Where the maximum ambient ceiling temperature will be from 101 °F to 150 °F, use intermediate temperature rated residential sprinklers (175 °F to 225 °F rated).

Residential sprinklers must be positioned a sufficient distance away from heat sources that include fireplaces, stoves, kitchen ranges, wall ovens, hot water pipes, water heaters, furnaces and associated flues and ducts, and light fixtures. The following minimum distances must be maintained for both ordinary and intermediate temperature rated residential sprinklers as indicated.

| Heat Source | Minimum Distance from Edge of Source to Ordinary Temperature Rated Sprinkler | | Minimum Distance from Edge of Source to Intermediate Temperature Rated Sprinkler | |
|---|---|---|---|---|
| | Inches | metric | Inches | metric |
| Side of open or recessed fireplace | 36 | .91 m | 12 | 305 mm |
| Front of recessed fire place | 60 | 1.5 m | 36 | .91 m |
| Coal- or wood-burning stove | 42 | 1.1 m | 12 | 305 mm |
| Kitchen range | 18 | 457 mm | 9 | 229 mm |
| Wall oven | 18 | 457 mm | 9 | 229 mm |
| Hot air flues | 18 | 457 mm | 9 | 229 mm |
| Uninsulated heat ducts | 18 | 457 mm | 9 | 229 mm |
| Uninsulated hot water pipes | 12 | 305 mm | 6 | 152 mm |
| Side of ceiling- or wall-mounted hot air diffusers | 24 | .61 m | 12 | 305 mm |
| Front of wall-mounted hot air diffusers | 36 | .91 m | 18 | 457 mm |
| Hot water heater or furnace | 6 | 152 mm | 3 | 76 mm |
| Light fixture less than 250W | 6 | 152 mm | 3 | 76 mm |
| Light fixture 250W to 499W | 12 | 305 mm | 6 | 152 mm |
| Where residential sprinklers will be exposed to the rays of the sun passing through glass or plastic skylights, use intermediate temperature rated sprinklers. | | | | |
| When locating residential sprinklers in an unventilated concealed compartment, under an unventilated attic or uninsulated roof, where the maximum ambient temperature does not exceed 150 °F, use intermediate temperature rated sprinklers. | | | | |

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# FREEDOM® RESIDENTIAL SPRINKLER INSTALLATION GUIDE

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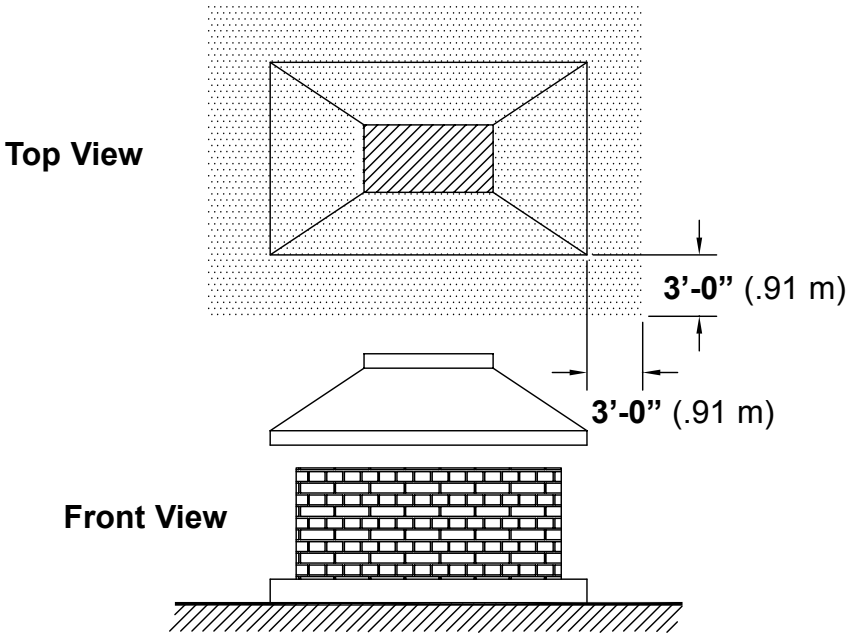
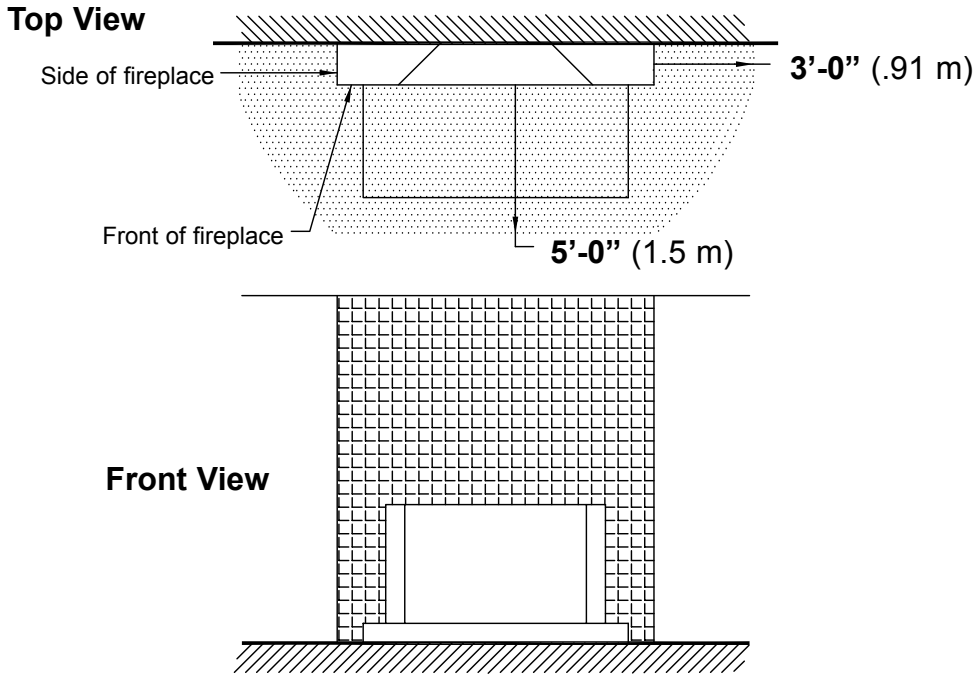
**Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com**

**NOTE:** The dimensions shown are intended to apply to residential sprinklers installed in ceilings above fireplaces used to burn products that cause elevated temperatures at or near the ceiling in areas surrounding the fireplace. The recommendations should not be construed to apply to decorative non-opening fireplaces such as gas fire units that will not cause elevated temperatures at the ceiling.




Sprinklers near an open hearth fireplace must be located outside of the shaded area or be intermediate degree rated.




Sprinklers near a recessed hearth fireplace must be located outside of the shaded area [at least 3'-0" (.91 m)] from the side of a recessed fireplace and at least 5'-0" (1.5 m) from the front) or be intermediate degree rated.

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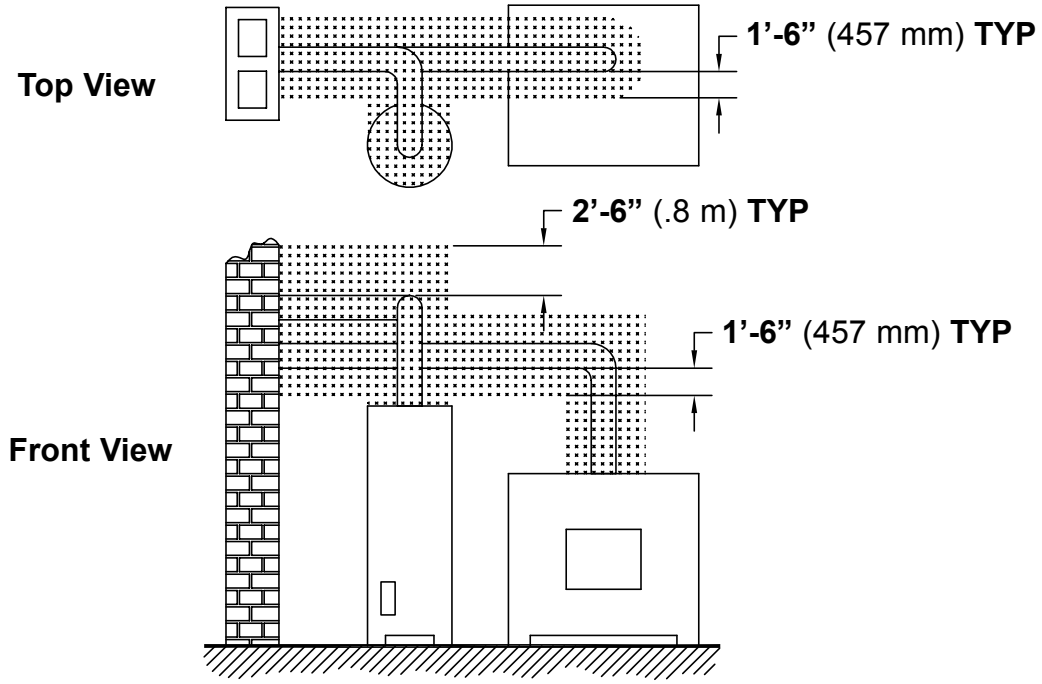
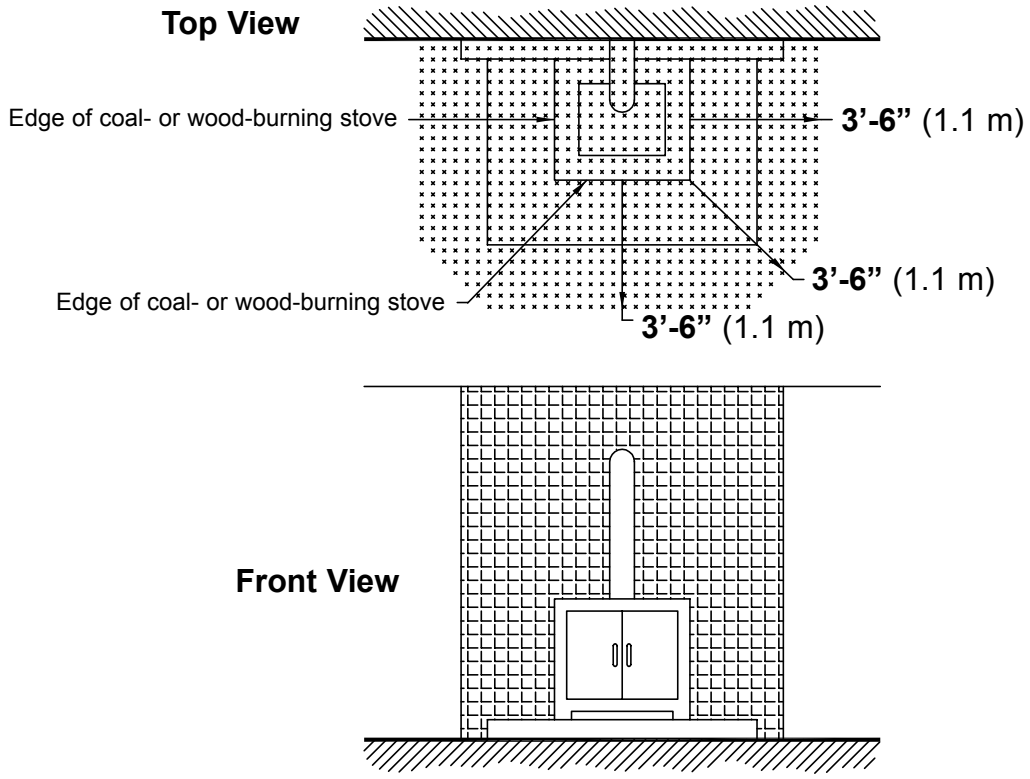



Sprinklers near a furnace or water heater must be located outside of the shaded area or be intermediate degree rated.




Sprinklers near a coal- or wood-burning stove must be located outside of shaded area or be intermediate degree rated.

# TECHNICAL DATA

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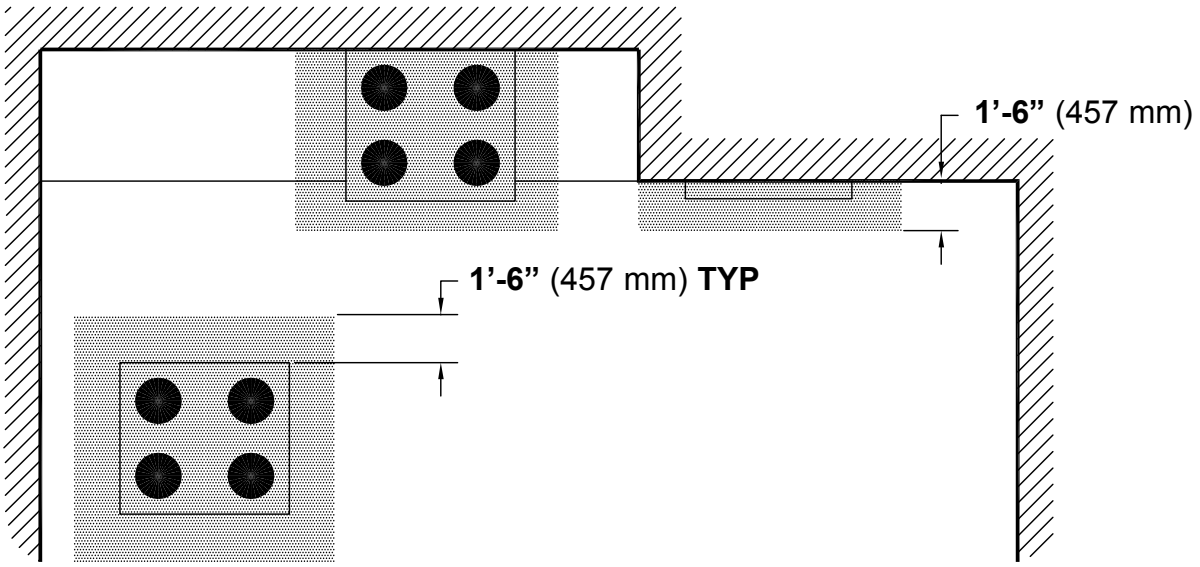
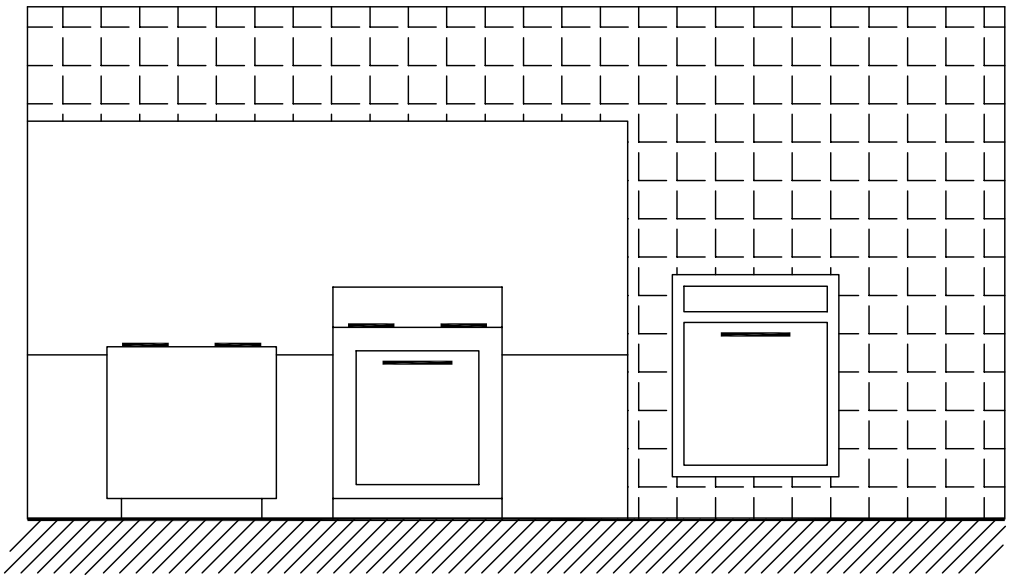
**Top View**




**Front View**



Sprinklers near a range or wall oven must be located outside of shaded areas or be intermediate degree rated.

Replaces pages 1-17, dated December 1, 2016.
(Added P65 Warning.)

Form No. F_080190 18.10.25 Rev 16.1.P65

# BULLETIN

# CARE AND HANDLING OF SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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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:**

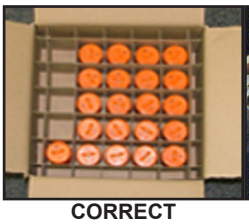
  **1/2" NPT: 14 ft-lbs. (19.0 N-m)**

  **3/4" NPT: 20 ft-lbs. (27.1 N-m)**

  **1" NPT: 30 ft-lbs. (40.7 N-m)**

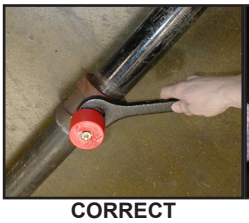

**CORRECT**
**(Original container used)**

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

**⚠ 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!

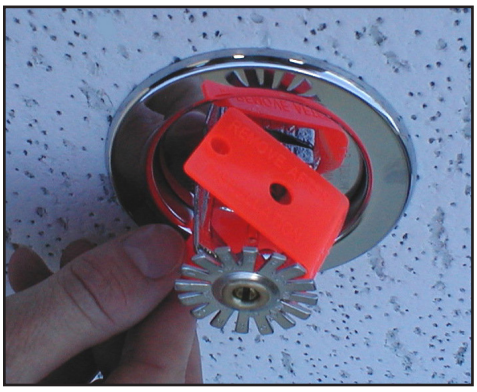

**Figure 1: Sprinkler shield being removed from a pendent sprinkler.**

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

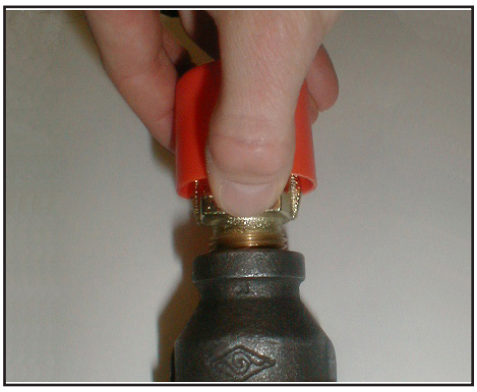

**Figure 3: Sprinkler cap being removed from and upright sprinkler.**

## 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.**

# BULLETIN

# CARE AND HANDLING OF SPRINKLERS

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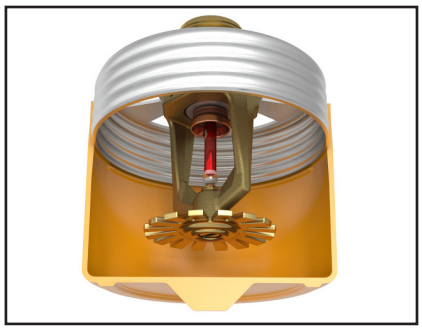
**⚠CAUTION CONCEALED COVER ASSEMBLIES ARE FRAGILE!**
**TO ASSURE SATISFACTORY PERFORMANCE OF THE PRODUCT, HANDLE WITH CARE.**



**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.**

VIKING

**BULLETIN**

# CARE AND HANDLING OF SPRINKLERS

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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.

**⚠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.**

# TECHNICAL DATA — SPRINKLER OVERVIEW

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## 1. DESCRIPTION

Viking fire sprinklers consist of a threaded frame with a specific waterway or orifice size and a deflector for distributing water in a specified pattern. A closed or sealed sprinkler refers to a complete assembly, including the thermosensitive operating element. An open sprinkler does not use an operating element and is open at all times. The distribution of water is intended to extinguish a fire or to control its spread.

Viking sprinklers are available in several models and styles. Refer to specific sprinkler technical data pages for available styles, finishes, temperature ratings, thread sizes, and nominal K-Factors for the particular model selected.

## 2. LISTINGS AND APPROVALS

Refer to the Approval Charts on the appropriate sprinkler technical data page(s) and/or approval agency listings.

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

## 3. TECHNICAL DATA

**Pressure Ratings:**

Maximum allowable water working pressure is 175 psig (12 Bar) unless rated and specified for high water working pressure [250 psig (17.2 bar)].

**Sprinkler Identification:**

Viking sprinklers are identified and marked with the word “Viking”, the sprinkler identification number (SIN) consisting of “VK” plus a three digit number*, the model letter, and the year of manufacture.

**Available Finishes:**

Viking sprinklers are available in several decorative finishes. Some models are available with corrosion-resistant coatings or are fabricated from non-corrosive material. Refer to the sprinkler technical data page for additional information.

**Available Temperature Ratings:**

Viking sprinklers are available in several temperature ratings that relate to a specific temperature classification. Applicable installation rules mandate the use and limitations of each temperature classification. In selecting the appropriate temperature classification, the maximum expected ceiling temperature must be known. When there is doubt as to the maximum temperature at the sprinkler location, a maximum-reading thermometer should be used to determine the temperature under conditions that would show the highest readings to be expected. In addition, recognized installation rules may require a higher temperature classification, depending upon sprinkler location, occupancy classification, commodity classification, storage height, and other hazards. In all cases, the maximum expected ceiling temperature dictates the lowest allowable temperature classification. Sprinklers located immediately adjacent to a heat source may require a higher temperature rating.

**K-Factors:**

Viking sprinklers are available in several orifice sizes with related K-Factors. The orifice is a tapered waterway and, therefore, the K-Factor given is nominal. Nominal U.S. K-Factors are provided in accordance with the 1999 edition of NFPA 13, Section 3-2.3. Refer to the specific data page for appropriate K-Factor information.

**Available Styles:**

Viking sprinklers are available for installation in several positions as indicated by a stamping on the deflector. The deflector style dictates the appropriate installation position of the sprinkler; it breaks the solid stream of water issuing from the sprinkler orifice to form a specific spray pattern. The following list indicates the various styles and identification of Viking sprinklers.

UPRIGHT SPRINKLER: A sprinkler intended to be installed with the deflector above the frame so water flows upward through the orifice, striking the deflector and forming an umbrella-shaped spray pattern downward. Marked “SSU” (Standard Sprinkler Upright) or “UPRIGHT” on the deflector.

PENDENT SPRINKLER: A sprinkler intended to be oriented with the deflector below the frame so water flows downward through the orifice, striking the deflector and forming an umbrella-shaped spray pattern downward. Marked “SSP” (Standard Sprinkler Pendent) or “PENDENT” on the deflector.

**Viking Technical Data may be found on The Viking Corporation’s Web site at http://www.vikinggroupinc.com. The Web site may include a more recent edition of this Technical Data Page.**

CONVENTIONAL SPRINKLER: An “old style” sprinkler intended to be installed with the deflector in either the upright or pendent position. The deflector provides a spherical type pattern with 40 to 60 percent of the water initially directed downward and a proportion directed upward. Must be installed in accordance with installation rules for conventional or old style sprinklers. DO NOT USE AS A REPLACEMENT FOR STANDARD SPRAY SPRINKLERS. Marked “C U/P” (Conventional Upright/Pendent) on the deflector.

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VERTICAL SIDEWALL (VSW) SPRINKLER: A sprinkler intended for installation near the wall and ceiling. The deflector provides a water spray pattern outward in a quarter-spherical pattern and can be installed in the upright or pendent position with the flow arrow in the direction of discharge. Marked “SIDEWALL” on the deflector with an arrow and the word “FLOW”. (Note: Some vertical sidewall sprinklers can only be installed in the upright or pendent position—in this case, the sprinkler will also be marked “UPRIGHT” or “PENDENT”.)

HORIZONTAL SIDEWALL (HSW) SPRINKLER: A sprinkler intended for installation near the wall and ceiling. The special deflector provides a water spray pattern outward in a quarter-spherical pattern. Most of the water is directed away from the nearby wall with a small portion directed at the wall behind the sprinkler. The top of the deflector is oriented parallel with the ceiling or roof. The flow arrows point in the direction of discharge. Marked “SIDEWALL” and “TOP” with an arrow and the word “FLOW”.

EXTENDED COVERAGE (EC) SPRINKLER: A spray sprinkler designed to discharge water over an area having the maximum dimensions indicated in the individual listings. Maximum area of coverage, minimum flow rate, orifice size, and nominal K-Factor are specified in the individual listings. EC sprinklers are intended for Light-Hazard occupancies with smooth, flat, horizontal ceilings unless otherwise specified. In addition to the above markings, the sprinkler is marked “EC”.

QUICK RESPONSE (QR) SPRINKLER: A spray sprinkler with a fast- actuating operating element. The use of quick response sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction (AHJ) prior to installing.

QUICK RESPONSE EXTENDED COVERAGE (QREC) SPRINKLER: A spray sprinkler designed to discharge water over an area having the maximum dimensions indicated in the individual listing. This is a sprinkler with an operating element that meets the criteria for quick response. QREC sprinklers are only intended for Light Hazard occupancies. The sprinkler is marked “QREC”.

FLUSH SPRINKLER: A decorative spray sprinkler intended for installation with a concealed piping system. The unit is mounted flush with the ceiling or wall, with the fusible link exposed. Upon actuation, the deflector extends beyond the ceiling or wall to distribute water discharge. The sprinkler is marked “SSP”, “PEND”, or “SIDEWALL” and “TOP”.

CONCEALED SPRINKLER: A decorative spray sprinkler intended for installation with a concealed piping system. The sprinkler is hidden from view by a cover plate installed flush with the ceiling or wall. During fire conditions, the cover plate detaches, and upon sprinkler actuation, the deflector extends beyond the ceiling or wall to distribute water discharge. The sprinkler is marked “SSP”, “PEND”, or “SIDEWALL” and “TOP”.

RECESSED SPRINKLER: A spray sprinkler assembly intended for installation with a concealed piping system. The assembly consists of a sprinkler installed in a decorative adjustable recessed escutcheon that minimizes the protrusion of the sprinkler beyond the ceiling or wall without adversely affecting the sprinkler distribution or sensitivity. Refer to the appropriate technical data page for allowable sprinkler models, temperature ratings, and occupancy classifications. DO NOT RECESS ANY SPRINKLER NOT LISTED FOR USE WITH THE ESCUTCHEON.

CORROSION-RESISTANT SPRINKLER: A special service sprinkler with non-corrosive protective coatings, or that is fabricated from non-corrosive material, for use in atmospheres that would normally corrode sprinklers.

DRY SPRINKLER: A special-service sprinkler intended for installation on dry pipe systems or wet pipe systems where the sprinkler is subject to freezing temperatures. The unit consists of a sprinkler permanently secured to an extension nipple with a sealed inlet end to prevent water from entering the nipple until the sprinkler operates. The unit MUST be installed in a tee fitting. Dry upright sprinklers are marked with the “B” dimension [distance from the face of the fitting (tee) to the top of the deflector]. Dry pendent and sidewall sprinklers are marked with the “A” dimension [the distance from the face of fitting (tee) to the finished surface of the ceiling or wall].

LARGE DROP SPRINKLER: A type of special application sprinkler used to provide fire control of specific high-challenge fire hazards. Large drop sprinklers are designed to produce an umbrella-shaped spray pattern downward with a higher percentage of “large” water droplets than standard spray sprinklers. The sprinkler has an extra-large orifice with a nominal K-Factor of 11.2. Marked “HIGH CHALLENGE” and “UPRIGHT”.

EARLY SUPPRESSION FAST-RESPONSE (ESFR) SPRINKLER: A sprinkler intended to provide fire suppression of specific high-challenge fire hazards through the use of a fast response fusible link, 14.0, 16.8, or 25.2 nominal K-Factor, and special deflector. ESFR sprinklers are designed to produce high-momentum water droplets in a hemispherical pattern below the deflector. This permits penetration of the fire plume and direct wetting of the burning fuel surface while cooling the atmosphere early in the development of a high-challenge fire. Marked “ESFR” and “UPRIGHT” or “PEND”.

INTERMEDIATE LEVEL/RACK STORAGE SPRINKLER: A standard spray sprinkler assembly designed to protect its operating element from the spray of sprinklers installed at higher elevations. The assembly consists of a standard or large orifice upright or pendent sprinkler with an integral upright or pendent water shield and guard assembly. Use only those sprinklers that have been tested and listed for use with the assembly. Refer to the technical data page for allowable sprinkler models.

RESIDENTIAL SPRINKLER: A sprinkler intended for use in the following occupancies: one- and two-family dwellings with the fire protection sprinkler system installed in accordance with NFPA 13D; residential occupancies up to four stories in height with the fire protection system installed in accordance with NFPA 13R; and where allowed by the Authority Having Jurisdiction in residential portions of any occupancy with the fire protection system installed in accordance with NFPA 13.

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Residential sprinklers have a unique distribution pattern and utilize a “fast response” heat sensitive operating element. They enhance survivability in the room of fire origin and are designed to provide a life safety environment for a minimum of ten minutes. For this reason, residential sprinklers must not be used to replace standard sprinklers unless tested for and approved by the Authority Having Jurisdiction. In addition to standard markings, the unit is identified as “RESIDENTIAL SPRINKLER” or “RES”.

## 4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

## 5. OPERATION

Refer to the appropriate sprinkler technical data page(s).

## 6. INSPECTIONS, TESTS AND MAINTENANCE

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

## 7. AVAILABILITY

Viking sprinklers are 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.

**IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers and the appropriate sprinkler general care, installation, and maintenance guide. 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. The sprinkler technical data page may contain installation requirements specific for the sprinkler model selected. The use of certain types of sprinklers may be limited due to occupancy and hazard. Refer to the Authority Having Jurisdiction prior to installation.**

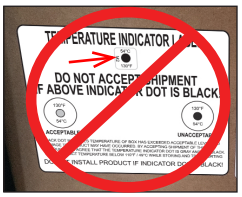
# BULLETIN

# BEST PRACTICES FOR RESIDENTIAL SPRINKLER HANDLING & INSTALLATION

**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.**

## SPRINKLERS ARE FRAGILE - HANDLE WITH CARE!

- Always keep sprinklers in a cool dry place.
- Protect sprinklers during storage, transport and handling as well as before, during and after installation. Refer to Viking's Care and Handling of Sprinklers Bulletin Form No. F_091699[2].
- Proper transit, storage and installation of sprinklers in a high-heat environment is a must. Care should be taken to prevent sprinklers from being exposed to ambient heat conditions in excess of those referenced in installation standards.
- Do not stage or store sprinklers on the job site in advance in a non-conditioned space prior to installation.
- Keep sprinklers in the original packaging and check temperature indicators on box label prior to installation. If the indicator has turned black, DO NOT install any product contained in the box. Refer to Viking product return policies.
- Temperatures exceeding the maximum ambient temperature of the sprinkler temperature-rating during storage, transport, handling and installation must be avoided.
- Per NFPA standards 13, 13R, and 13D, sprinklers installed where maximum ambient temperatures are at or over 101 °F (38 °C ) through 150 °F (66 °C) shall be intermediate temperature-rated sprinklers. Additionally, if sprinklers are installed in an unventilated concealed space under an uninsulated roof or in an unventilated attic, they shall be of intermediate temperature classification.
- Sprinklers installed where ambient temperatures are at or below 100 °F (38 °C) may be either ordinary or intermediate temperature-rated sprinklers. Refer to NFPA standards 13R 6.2.3.1 and 13D 7.5.6.1.
- Rough-in of sprinkler piping during hot weather conditions should not include the installation of sprinklers unless reasonable ambient temperatures can be maintained. Ambient temperatures that are considered when choosing the temperature rating for a sprinkler should take into account the range of ambient temperatures that are expected from installation through establishment and maintenance of temperature in a conditioned space. Appropriate insulation may be considered. **Example**: An ordinary temperature sprinkler should not be exposed to maximum ambient temperature higher than 100 °F (38 °C) or more. Refer to NFPA 13, Table 6.2.5.1, NFPA 13R, 6.2.3.1 and NFPA 13D, 7.5.6.1.
- CPVC fire sprinkler products exposed to high ambient temperatures (e.g. installed in unventilated, concealed spaces such as attics) should be insulated to maintain a cooler environment. Refer to Viking Plastics Installation and Design Manual, Form No. F_080712[2], for care and handling procedures.
- Protect all sprinklers and connecting CPVC piping in attic spaces and unvented concealed spaces from excessive heat exposure above 100 °F (38 °C). To separate excessive attic heat, properly tent and fully insulate all pipe in unconditioned spaces.
- Pressure relief valves should be installed on wet sprinkler systems where there is a risk of over-pressurization of a checked water supply, due to thermal expansion. Refer to NFPA 13, 7.1.2.1 and NFPA 13D, A.5.2.2.2.
- Fire sprinkler systems should be installed per current referenced editions of building codes and installation standards adopted in the jurisdiction where work is being performed.



**INCORRECT**
**(Heat exposure)**


**INCORRECT**
**(Unconditioned at rough-in)**


**INCORRECT**
**(Exposed piping)**


**INCORRECT**
**(No pressure relief valve)**

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

[1]Hot weather condition is defined as temperatures that can reach the maximum ambient temperature-rating of the sprinkler.
[2]Clicking on blue hyperlink will open referenced document.

### ⚠ 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.**

VIKING®

BULLETIN

# REGULATORY AND HEALTH WARNINGS

**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

Regulatory and Health Warnings applying to materials used in the manufacture and construction of fire protection products are provided herin 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, titaninum 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.

BULL MOOSE TUBE

# EDDYTHREAD SPRINKLER PIPE SUBMITTAL DATA SHEET

## APPROVALS AND SPECIFICATIONS

- ASTM A135, Grade A
- ASTM A795, Type E, Grade A
- Pressure rated to 300 psi
- Underwriters Laboratories—United States of America
- Underwriters Laboratories—Canada
- Factory Mutual
- NFPA-13
- NFPA-13R
- NFPA-14
- CIVIL DEFENSE APPROVAL—United Arab Emirates
- Made in the United States of America
- UL, ULC & FM listed for roll-groove, plain-end and welded joints for wet, dry, preaction and deluge sprinkler systems.
- LEED v4 Certified

## FINISHES AND COATINGS

- Eddythread Sprinkler Pipe receives an OD mill coating of water-based paint which has corrosion protection expected with a painted carbon steel product, i.e. it would be expected to resist corrosion for an extended and indefinite period in a clean and dry environment and, as environmental conditions deteriorate, the corrosion protection would also diminish.
- Eddythread Sprinkler Pipe (black) receives an ID mill coating of Eddy Guard II MIC preventative coating. EG2 has been tested at independent laboratories to resist bacterial growth and maintain minimal bacterial count after multiple flushes (25) of the pipe.
- Eddythread Sprinkler Pipe when Hot Dip Galvanized by ASTM A123 and supplied by Bull Moose Tube is UL listed and FM approved.

## PRODUCT IDENTIFICATION

- Every length of Bull Moose fire sprinkler pipe features large, easy-to-read, continuous stenciling, clearly identifying the manufacturer, type of pipe, size, and length.

| Nominal Pipe Size (inches) | 1 | 1-1/4" | 1-1/2" | 2" |
|---|---|---|---|---|
| O.D. (in) | 1.295 | 1.650 | 1.900 | 2.375 |
| I.D. (in) | 1.083 | 1.418 | 1.654 | 2.123 |
| Empty Weight (lb/ft) | 1.461 | 2.070 | 2.547 | 3.308 |
| Water Filled Weight (lb/ft) | 1.860 | 2.754 | 3.468 | 4.842 |
| C.R.R.* | 1.00 | 1.00 | 1.00 | 1.00 |
| Pieces per Lift | 70 | 51 | 44 | 30 |

*Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY

## SUBMITTAL INFORMATION

Project

Contractor

Engineer

Specification Reference

Date

System Type

Locations

Comments

◯ Eddythread - Black ◯ Eddythread - Hot Dip Galvanized

BULLMOOSETUBE.COM
1819 Clarkson Road, Chesterfield, MO 63017
US: 800.325.4467 | Canada: 800.882.4666 | sales@BullMooseIndustries.com

ASC Engineered Solutions

# Fig. 3201 90˚ Elbow


c UL us LISTED FM APPROVED

For Listings/Approval Details and Limitations, visit our website at www.asc-es.com or contact an ASC Engineered Solutions™ Sales Representative.

## Material Specifications

**Dimensions:** ASME B16.3

**Material:** ASTM A536 Grade 65-45-12

**Finish:** Black

**Threads:** NPT per ASME B1.20.1

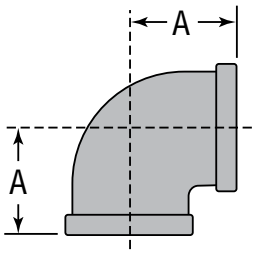
**Agency Approvals:** All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

**Note:** Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened approximately three turns beyond hand tight, but no more than four turns.

## Figure 3201 90˚ Elbow

| Nominal Size | Maximum Working Pressure ▲ | Dimension A | Approx Wt. Each |
|---|---|---|---|
| In. (mm) | psi (kPa) | In. (mm) | Lbs. (kg) |
| 1<br>20 | 500<br>3450 | 1.50<br>38.10 | 0.62<br>0.68 |
| 1¼<br>32 | 500<br>3450 | 1.75<br>44.45 | 0.90<br>0.41 |
| 1½<br>40 | 500<br>3450 | 1.94<br>49.276 | 1.20<br>0.54 |
| 2<br>50 | 500<br>3450 | 2.25<br>57.15 | 1.85<br>0.84 |

▲ – Working Pressure Ratings are for reference only and based on Sch. 40 pipe. For the latest UL/ULC, and FM pressure ratings versus pipe schedule, please visit asc-es.com or contact your local ASC Engineering Solutions™ Representative.




SCI An ASC Engineered Solution

| PROJECT INFORMATION | APPROVAL STAMP |
|---|---|
| Project: | ☐ Approved |
| Address: | ☐ Approved as noted |
| Contractor: | ☐ Not approved |
| Engineer: | Remarks: |
| Submittal Date: | |
| Notes 1: | |
| Notes 2: | |

ASC Engineered Solutions

# Straight Tee
# Fig. 3205


c UL us LISTED FM APPROVED

For Listings/Approval Details and Limitations, visit our website at www.asc-es.com or contact an ASC Engineered Solutions™ Sales Representative.

## Material Specifications

**Dimensions:** ASME B16.3

**Material:** ASTM A536 Grade 65-45-12

**Finish:** Black

**Threads:** NPT per ASME B1.20.1

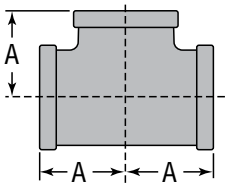
**Agency Approvals:** All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

**Note:** Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened approximately three turns beyond hand tight, but no more than four turns.

## Figure 3205 Straight Tee

| Nominal Size | Maximum Working Pressure ▲ | Dimension A | Approx Wt. Each |
|---|---|---|---|
| In. (mm) | psi (kPa) | In. (mm) | Lbs. (kg) |
| 1<br>25 | 500<br>3450 | 1.50<br>38.10 | 0.85<br>0.39 |
| 1¼<br>32 | 500<br>3450 | 1.75<br>44.45 | 1.22<br>0.55 |
| 1½<br>40 | 500<br>3450 | 1.94<br>49.27 | 1.55<br>0.70 |
| 2<br>50 | 500<br>3450 | 2.25<br>57.15 | 2.45<br>1.11 |

▲ – Working Pressure Ratings are for reference only and based on Sch. 40 pipe. For the latest UL/ULC, and FM pressure ratings versus pipe schedule, please visit asc-es.com or contact your local ASC Engineering Solutions™ Representative.

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| PROJECT INFORMATION | APPROVAL STAMP |
|---|---|
| Project: | ☐ Approved |
| Address: | ☐ Approved as noted |
| Contractor: | ☐ Not approved |
| Engineer: | Remarks: |
| Submittal Date: | |
| Notes 1: | |
| Notes 2: | |

ASC Engineered Solutions

# Reducing Tee
# Fig. 3205R


c UL us LISTED FM APPROVED

For Listings/Approval Details and Limitations, visit our website at www.asc-es.com or contact an ASC Engineered Solutions™ Sales Representative.

## Material Specifications

**Dimensions:** ASME B16.3

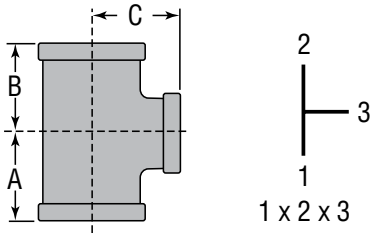
**Material:** ASTM A536 Grade 65-45-12

**Finish:** Black

**Threads:** NPT per ASME B1.20.1

**Agency Approvals:** All ductile iron threaded fittings are UL/ULC Listed and FM Approved.

**Note:** Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened approximately three turns beyond hand tight, but no more than four turns.




## Figure 3205R Reducing Tee

| Nominal Size 1 x 2 x 3 | Maximum Working Pressure ▲ | Dimensions A | B | C | Approx Wt. Each |
|---|---|---|---|---|---|
| In. (mm) | psi (kPa) | In. (mm) | In. (mm) | In. (mm) | Lbs. (kg) |
| 1 x ½ x 1<br>25 x 15 x 25 | 500<br>3450 | 1.50<br>38.10 | 1.36<br>34.54 | 1.50<br>38.10 | 0.64<br>0.29 |
| 1 x ¾ x 1<br>25 x 20 x 25 | 500<br>3450 | 1.50<br>38.10 | 1.45<br>36.83 | 1.50<br>38.10 | 0.73<br>0.33 |
| 1 x 1 x ½<br>25 x 25 x 15 | 500<br>3450 | 1.26<br>32.00 | 1.26<br>32.00 | 1.36<br>34.54 | 0.71<br>0.32 |
| 1 x 1 x ¾<br>25 x 25 x 20 | 500<br>3450 | 1.37<br>34.80 | 1.37<br>34.80 | 1.45<br>36.83 | 0.76<br>0.34 |
| 1 x 1 x 1¼*<br>25 x 25 x 32 | 500<br>3450 | 1.67<br>42.41 | 1.67<br>42.41 | 1.58<br>40.13 | 0.98<br>0.44 |
| 1 x 1 x 1½*<br>25 x 25 x 40 | 500<br>3450 | 1.80<br>45.72 | 1.80<br>45.72 | 1.65<br>41.91 | 1.16<br>0.53 |
| 1¼ x 1 x ½*<br>32 x 25 x 15 | 500<br>3450 | 1.34<br>34.04 | 1.26<br>32.00 | 1.53<br>38.86 | 0.82<br>0.37 |
| 1¼ x 1 x ¾<br>32 x 25 x 20 | 500<br>3450 | 1.45<br>36.83 | 1.37<br>34.80 | 1.62<br>41.15 | 0.90<br>0.41 |
| 1¼ x 1 x 1<br>32 x 25 x 25 | 500<br>3450 | 1.58<br>40.13 | 1.50<br>38.10 | 1.67<br>42.42 | 1.00<br>0.45 |
| 1¼x 1 x 1¼<br>32 x 25 x 32 | 500<br>3450 | 1.75<br>44.45 | 1.67<br>42.42 | 1.75<br>44.45 | 1.08<br>0.49 |
| 1¼ x 1 x 1½<br>32 x 25 x 40 | 500<br>3450 | 1.88<br>47.75 | 1.80<br>45.72 | 1.82<br>46.22 | 1.42<br>0.64 |
| 1¼ x 1¼ x ½<br>32 x 32 x 15 | 500<br>3450 | 1.34<br>34.04 | 1.34<br>34.04 | 1.53<br>38.86 | 0.86<br>0.39 |

▲ – Working Pressure Ratings are for reference only and based on Sch. 40 pipe. For the latest UL/ULC, and FM pressure ratings versus pipe schedule, please visit asc-es.com or contact your local ASC Engineering Solutions™ Representative.

*Part supplied as "Bull Head Tee".

## Figure 3205R Reducing Tee

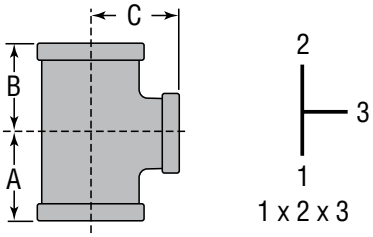
| Nominal Size 1 x 2 x 3 | Maximum Working Pressure ▲ | Dimensions A | B | C | Approx Wt. Each |
|---|---|---|---|---|---|
| In. (mm) | psi (kPa) | In. (mm) | In. (mm) | In. (mm) | Lbs. (kg) |
| 1¼ x 1¼ x ¾<br>32 x 32 x 20 | 500<br>3450 | 1.45<br>36.83 | 1.45<br>36.83 | 1.62<br>41.15 | 0.92<br>0.42 |
| 1¼ x 1¼ x 1<br>32 x 32 x 25 | 500<br>3450 | 1.58<br>40.13 | 1.58<br>40.13 | 1.67<br>42.42 | 0.95<br>0.43 |
| 1¼ x 1¼ x 1½*<br>32 x 32 x 40 | 500<br>3450 | 1.88<br>47.75 | 1.88<br>47.75 | 1.82<br>46.22 | 1.45<br>0.66 |

SCI An ASC Engineered Solution

| PROJECT INFORMATION | APPROVAL STAMP |
|---|---|
| Project: | ☐ Approved |
| Address: | ☐ Approved as noted |
| Contractor: | ☐ Not approved |
| Engineer: | Remarks: |
| Submittal Date: | |
| Notes 1: | |
| Notes 2: | |

ASC Engineered Solutions

# Reducing Tee
# Fig. 3205R




## Figure 3205R Reducing Tee

| Nominal Size | Maximum Working Pressure ▲ | Dimensions | | | Approx Wt. Each |
|---|---|---|---|---|---|
| 1 x 2 x 3 | | A | B | C | |
| In. (mm) | psi (kPa) | In. (mm) | In. (mm) | In. (mm) | Lbs. (kg) |
| 1¼ x 1¼ x 2* 32 x 32 x 50 | 500 3450 | 2.10 53.34 | 2.10 53.34 | 1.90 48.26 | 1.75 0.79 |
| 1½ x 1 x ½ 40 x 25 x 15 | 500 3450 | 1.41 35.81 | 1.34 34.04 | 1.66 42.16 | 0.95 0.43 |
| 1½ x 1 x ¾ 40 x 25 x 20 | 500 3450 | 1.52 38.61 | 1.37 34.80 | 1.75 44.45 | 1.14 0.52 |
| 1½ x 1 x 1 40 x 25 x 25 | 500 3450 | 1.65 41.91 | 1.50 38.10 | 1.80 45.72 | 1.17 0.53 |
| 1½ x 1 x 1¼ 40 x 25 x 32 | 500 3450 | 1.82 46.23 | 1.67 42.42 | 1.88 47.75 | 1.34 0.61 |
| 1½ x 1 x 1½ 40 x 25 x 40 | 500 3450 | 1.94 49.28 | 1.80 45.72 | 1.94 49.28 | 1.45 0.66 |
| 1½ x 1¼x ½ 40 x 32 x 15 | 500 3450 | 1.41 35.81 | 1.34 34.04 | 1.66 42.16 | 1.05 0.48 |
| 1½ x 1¼ x ¾ 40 x 32 x 20 | 500 3450 | 1.52 38.61 | 1.45 36.83 | 1.75 44.45 | 1.15 0.5 |
| 1½ x 1¼ x 1 40 x 32 x 25 | 500 3450 | 1.65 41.91 | 1.58 40.13 | 1.80 45.72 | 1.25 0.57 |
| 1½ x 1¼ x 2* 40 x 32 x 50 | 500 3450 | 2.16 54.86 | 2.10 53.34 | 2.02 51.30 | 1.90 0.86 |
| 1½ x 1½ x ½ 40 x 40 x 15 | 500 3450 | 1.41 35.81 | 1.41 35.81 | 1.16 29.46 | 1.15 0.52 |
| 1½ x 1½ x ¾ 40 x 40 x 20 | 500 3450 | 1.52 38.61 | 1.52 38.61 | 1.75 44.45 | 1.24 0.56 |
| 1½ x 1½ x 1 40 x 40 x 25 | 500 3450 | 1.65 41.91 | 1.65 41.91 | 1.80 45.72 | 1.30 0.59 |
| 1½ x 1½ x 1¼ 40 x 40 x 32 | 500 3450 | 1.82 46.23 | 1.82 46.23 | 1.88 47.75 | 1.48 0.67 |

## Figure 3205R Reducing Tee

| Nominal Size | Maximum Working Pressure ▲ | Dimensions | | | Approx Wt. Each |
|---|---|---|---|---|---|
| 1 x 2 x 3 | | A | B | C | |
| In. (mm) | psi (kPa) | In. (mm) | In. (mm) | In. (mm) | Lbs. (kg) |
| 1½ x 1½ x 2* 40 x 40 x 50 | 500 3450 | 2.16 54.86 | 2.16 54.86 | 2.02 51.30 | 1.98 0.90 |
| 2 x 1 x 2 50 x 25 x 50 | 500 3450 | 2.25 57.15 | 2.02 51.31 | 2.25 57.15 | 2.15 0.98 |
| 2 x 1¼ x 2 50 x 32 x 50 | 500 3450 | 2.25 57.15 | 2.10 53.34 | 2.25 57.15 | 2.30 1.04 |
| 2 x 1½ x ½ 50 x 40 x 15 | 500 3450 | 1.49 37.85 | 1.41 35.81 | 1.88 47.75 | 1.50 0.68 |
| 2 x 1½ x ¾ 50 x 40 x 20 | 500 3450 | 1.60 40.64 | 1.52 38.61 | 1.97 50.04 | 1.62 0.73 |
| 2 x 1½ x 1 50 x 40 x 25 | 500 3450 | 1.73 43.94 | 1.65 41.91 | 2.02 51.31 | 1.64 0.74 |
| 2 x 1½ x 1¼ 50 x 40 x 32 | 500 3450 | 1.90 48.26 | 1.82 46.23 | 2.10 53.34 | 1.80 0.82 |
| 2 x 1½ x 1½ 50 x 40 x 40 | 500 3450 | 2.02 51.31 | 1.94 49.28 | 2.16 54.86 | 2.00 0.91 |
| 2 x 1½ x 2 50 x 40 x 50 | 500 3450 | 2.25 57.15 | 2.16 54.86 | 2.25 57.15 | 2.35 1.07 |
| 2 x 2 x ½ 50 x 50 x 15 | 500 3450 | 1.49 37.85 | 1.49 37.85 | 1.88 47.75 | 1.60 0.73 |
| 2 x 2 x ¾ 50 x 50 x 20 | 500 3450 | 1.60 40.64 | 1.60 40.64 | 1.97 50.04 | 1.68 0.76 |
| 2 x 2 x 1 50 x 50 x 25 | 500 3450 | 1.73 43.94 | 1.73 43.94 | 2.02 51.31 | 1.85 0.84 |
| 2 x 2 x 1¼ 50 x 50 x 32 | 500 3450 | 1.90 44.45 | 1.90 42.42 | 2.10 44.45 | 2.04 0.93 |
| 2 x 2 x 1½ 50 x 50 x 40 | 500 3450 | 2.02 44.45 | 2.02 42.42 | 2.16 44.45 | 2.18 0.99 |

▲ – Working Pressure Ratings are for reference only and based on Sch. 40 pipe. For the latest UL/ULC, and FM pressure ratings versus pipe schedule, please visit asc-es.com or contact your local ASC Engineering Solutions™ Representative.

*Part supplied as "Bull Head Tee".

SCI An ASC Engineered Solution

# BLAZEMASTER CPVC Fire Sprinkler Pipe & Fittings Submittal Sheet

## General Description

TYCO CPVC Pipe and Fittings produced by Johnson Controls are designed exclusively for use in wet pipe automatic fire sprinkler systems. The TYCO CPVC Pipe and Fittings are produced from BLAZEMASTER CPVC compound that is a specially developed thermoplastic compound composed of post chlorinated polyvinyl chloride (CPVC) resin and state of the art additives. TYCO CPVC Pipe and Fittings are easier to install than traditional steel pipe systems, and at the same time, provide superior heat resistance and strength as compared to traditional CPVC and PVC piping materials used in the plumbing trade. Various adapters are available to connect CPVC pipe to metallic piping. All female pipe thread adapters have brass inserts for durability. Grooved adapters connect directly to grooved end valves and metallic pipe, with flexible grooved end couplings.

***NOTICE***

*The CPVC Pipe and Fittings produced with BLAZEMASTER CPVC compound described herein must be installed and maintained in compliance with this document and with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), in addition to the standards of any 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.*

## Technical Data

**Sizes**
3/4 Inch to 3 Inch

**Maximum Working Pressure**
175 psi

**Approvals**
UL and C-UL Listed
FM Approved
LPCB Approved
NSF Certified
MEA Approved

(Refer to Installation Handbook IH-1900 dated April 2016 for exact listing/approval information.)

**Manufacture Source**
U.S.A.

**Material**
Pipe:
ASTM F442, SDR 13.5

Fittings:
ASTM F438 (Sch. 40)
ASTM F439 (Sch. 80)
ASTM F1970

**Color**
Orange

## Installation

TYCO CPVC Pipe and Fittings are to be to be installed in accordance with Installation Handbook IH-1900.

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

# *Care and Maintenance*

TYCO CPVC Pipe and Fittings are to be maintained and serviced in accordance with this section.

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

After placing a fire protection system in service, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and de-vices in compliance with this document, as well as with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

Automatic sprinkler systems should 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.

**1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700**

## TYCO CPVC SPECIFICATIONS

### Pipe

TYCO CPVC sprinkler pipe conforms to the requirements of ASTM F442 and is produced to SDR 13.5. SDR (Standard Dimension Ratio) is the ratio of the outside pipe diameter to the wall thickness of the pipe. The pipe carries the NSF International (NSF-pw) mark for use in potable water systems. See Tables D1 and D2 for dimensions of pipe.

**Table D1 - U.S. Units**
**Dimensions for TYCO CPVC Pipe**

| Nominal Pipe Size ANSI Inches | Nominal O.D. Inches | Nominal I.D. Inches | Empty Weight Pounds / Foot | Water Filled Weight Pounds / Foot | Volume Gallons / Foot |
|---|---|---|---|---|---|
| **3/4** | 1.050 | 0.874 | 0.168 | 0.428 | 0.031 |
| **1** | 1.315 | 1.101 | 0.262 | 0.675 | 0.049 |
| **1 1/4** | 1.660 | 1.394 | 0.418 | 1.079 | 0.079 |
| **1 1/2** | 1.900 | 1.598 | 0.548 | 1.417 | 0.104 |
| **2** | 2.375 | 2.003 | 0.859 | 2.224 | 0.164 |
| **2 1/2** | 2.875 | 2.423 | 1.257 | 3.255 | 0.239 |
| **3** | 3.500 | 2.950 | 1.867 | 4.829 | 0.355 |

**Table D2 - Metric Units**
**Dimensions for TYCO CPVC Pipe**

| Nominal Pipe Size DN | Nominal O.D. Millimeters | Nominal I.D. Millimeters | Empty Weight Kilograms/ Meter | Water Filled Weight Kilograms/ Meter | Volume Liters / Meter |
|---|---|---|---|---|---|
| **DN20** | 26,7 | 22,0 | 0,250 | 0,637 | 0,102 |
| **DN25** | 33,4 | 28,0 | 0,390 | 1,000 | 0,161 |
| **DN32** | 42,4 | 35,4 | 0,622 | 1,606 | 0,260 |
| **DN40** | 48,3 | 40,6 | 0,816 | 2,109 | 0,342 |
| **DN50** | 60,3 | 50,9 | 1,278 | 3,310 | 0,538 |
| **DN65** | 73,0 | 61,5 | 1,871 | 4,844 | 0,786 |
| **DN80** | 88,9 | 75,0 | 2,778 | 7,186 | 1,166 |

## Fittings

TYCO CPVC sprinkler fittings conform to the requirements of ASTM F438 (Schedule 40 dimensions from 3/4 in. to 1 1/2 in. (DN20 to DN32), ASTM F439 (Schedule 80 dimensions for 1 1/2 in. to 3 in. (DN40 to DN80) and ASTM F1970 (Transition Fittings). Rapid Seal Adapter (RSA) threaded sprinkler connection fittings and slip style fittings carry the NSF International (NSF-pw) mark for use in potable water systems. All other threaded sprinkler adapter fittings feature brass inserts and are not NSF-pw rated. See Appendix A for sprinkler fittings types, sizes, socket and take-out dimensions.

## Solvent Cement

TYCO CPVC socket connections shall be joined using TFP-500 or TFP-600 One Step Solvent Cement as indicated in the “Listing and Approvals” section. TFP-500 and TFP-600 One Step Solvent Cements meet ASTM F493, NSF, FM, UL and LPCB requirements. Review solvent cementing instructions within this handbook prior to installation.

### PRODUCT RATINGS AND CAPABILITIES

## Ambient Temperature and Heat Sources

TYCO CPVC Pipe and Fittings shall be installed in areas where the ambient temperature does not exceed 150°F (65°C). (LPCB maximum ambient temperature of 50°C)

Before penetrating fire rated walls and partitions, consult building codes and authorities having jurisdiction in your area. TYCO CPVC systems should be designed and installed so that the piping is not closely exposed to high heat producing sources, such as incandescent light, ballasts, and steam lines.

## Pressure Rating

TYCO CPVC Pipe and Fittings are Listed/Approved for a rated pressure of 175 psi (12,1 bar) and a maximum ambient temperature of 150°F (65°C). (LPCB maximum ambient temperature of 50°C)

## Friction Loss

TYCO CPVC Pipe has a Hazen-Williams C-Value of 150. Pipe friction loss calculations shall be made according to NFPA Standards. Tables F1 and F2 show the allowance of friction loss for fittings, expressed in equivalent feet of pipe.

**Table F1**
**Allowance for Friction Loss in Fittings[3]**

| Fitting Size ANSI Inches | 3/4 | 1 | 1 1/4 | 1 1/2 | 2 | 2 1/2 | 3 |
|---|---|---|---|---|---|---|---|
| Tee Branch- ft | 3 | 5 | 6 | 8 | 10 | 12 | 15 |
| Elbow 90°[1]- ft | 4 | 5 | 6 | 7 | 9 | 12 | 13 |
| Elbow 45°- ft | 1 | 1 | 2 | 2 | 2 | 3 | 4 |
| Coupling- ft | 1 | 1 | 1 | 1 | 1 | 2 | 2 |
| Tee Run[2]- ft | 1 | 1 | 1 | 1 | 1 | 2 | 2 |



**Table F2**
**Allowance for Friction Loss in Fittings[3]**

| Fitting Size DN | DN20 | DN25 | DN32 | DN40 | DN50 | DN65 | DN80 |
|---|---|---|---|---|---|---|---|
| Tee Branch- m | 0,9 | 1,5 | 1,8 | 2,4 | 3,1 | 3,7 | 4,6 |
| Elbow 90°[1]- m | 1,2 | 1,5 | 1,8 | 2,1 | 2,7 | 3,7 | 4,0 |
| Elbow 45°- m | 0,3 | 0,3 | 0,6 | 0,6 | 0,6 | 0,9 | 1,2 |
| Coupling- m | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,6 | 0,6 |
| Tee Run[2]- m | 0,3 | 0,3 | 0,3 | 0,3 | 0,3 | 0,6 | 0,6 |

1. The above stated friction loss values are for TYCO fittings only. When using other Listed TYCO CPVC 90° elbows with BLAZEMASTER products, consult the fitting manufacturer's installation and design manuals.
2. Per manufacturer's test.

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

# Series 4000B-FP

## Reduced Pressure Zone Assemblies

### Sizes: 1" – 2"

Series 4000B-FP Reduced Pressure Zone Assemblies are designed to protect potable water supplies in accordance with national plumbing codes and water authority requirements. This series can be used in a variety of installations, including the prevention of health hazard cross connections in piping systems or for containment at the service line entrance.

This series features two in-line, independent check valves, captured springs and replaceable check seats with an intermediate relief valve. Its compact modular design facilitates easy maintenance and assembly access.

2" 4000BM2-FP-GV

### Features

- Single access cover and modular check construction for ease of maintenance
- Top entry — all internals immediately accessible
- Captured springs for safe maintenance
- Internal relief valve for reduced installation clearances
- Replaceable seats for economical repair
- Bronze body construction for durability — 1" to 2"
- Ball valve test cocks — screwdriver slotted — 1" to 2"
- Large body passages provides low pressure drop
- Compact, space saving design
- No special tools required for servicing
- Gear operated, slow close shutoffs
- Pre-wired tamper switch (2) per shutoff

### Specifications

A Reduced Pressure Zone Assembly shall be installed at each potential health hazard location to prevent backflow due to back-siphonage and/or backpressure. The assembly shall consist of an internal pressure differential relief valve located in a zone between two positive seating check modules with captured springs and silicone seat discs. Seats and seat discs shall be replaceable in both check modules and the relief valve. There shall be no threads or screws in the waterway exposed to line fluids. Service of all internal components shall be through a single access cover secured with stainless steel bolts. The assembly shall also include two gear operated slow close resilient seated isolation valves, four resilient seated test cocks and an air gap drain fitting. The assembly shall meet the requirements of: USC Manual 8th Edition†; ASSE Std. 1013; AWWA Std. C511; CSA B64.4. The assembly shall be an Ames Fire & Waterworks Series 4000B-FP.

***NOTICE***

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.



AMES FIRE & WATERWORKS

A WATTS Brand

## Materials

Bronze body construction, silicone rubber disc material in the first and second check plus the relief valve. Replaceable polymer check seats for first and second checks. Removable relief valve seat, cover bolts.

Standardly furnished with NPT body connections. Series 4000B-FP furnished with gear operated, full port, resilient seated, bronze ball valve shutoffs.

## Standards

AWWA C511-92, IAPMO File No. 1563

## Approvals

1013 B64.4

Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.

## Pressure – Temperature

Suitable for supply pressures up to 175 psi (12.06 bar) and water temperature to 180°F (75°C) continuous.

## Available Models

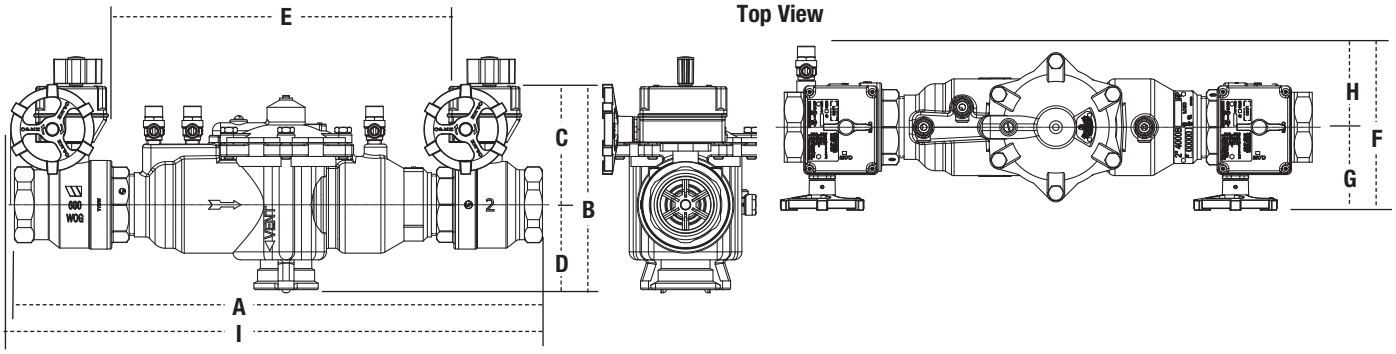
**No suffix** Female NPT Inlet/Outlet

**GV** Grooved Inlet/Outlet

***NOTICE***

Inquire with governing authorities for local installation requirements

## Dimensions — Weights



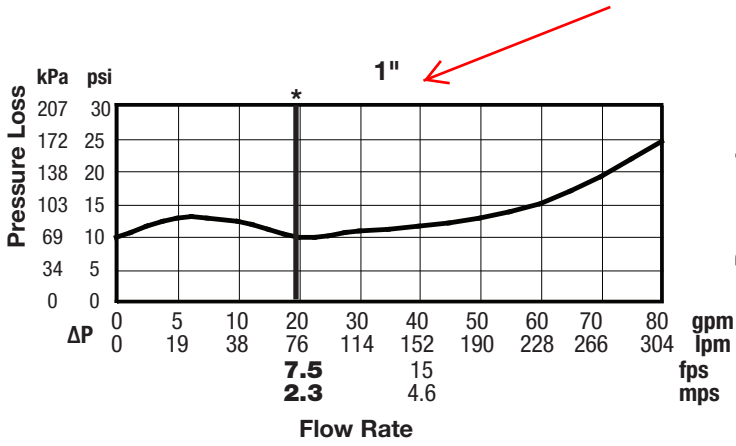

| MODEL | SIZE | DIMENSIONS | | | | | | | | | | | | | | | | | | | | WEIGHT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | A | | | | B | | C | | D | | E | | F | | G | | H | | I | | | |
| | | FNPT | | GROOVED | | | | | | | | | | | | | | | | | | | |
| | *in.* | *in.* | *mm* | *in.* | *mm* | *in.* | *mm* | *in.* | *mm* | *in.* | *mm* | *in.* | *mm* | *in.* | *mm* | *in.* | *mm* | *in.* | *mm* | *in.* | *mm* | *lbs.* | *kgs.* |
| 4000BM2-FP | 1 | 13¼ | 337 | 13½ | 343 | 5 13⁄16 | 148 | 3½ | 89 | 2 5⁄16 | 59 | 9¼ | 235 | 5¾ | 146 | 2⅞ | 73 | 2⅞ | 73 | 15⅝ | 397 | 15.8 | 7.2 |
| 4000BM2-FP | 1¼ | 15⅝ | 397 | 16 | 406 | 6⅛ | 156 | 3¾ | 95 | 2⅜ | 60 | 11⅛ | 283 | 6 1⁄16 | 154 | 2⅞ | 73 | 3 3⁄16 | 81 | 17⅞ | 454 | 19.1 | 8.7 |
| 4000BM2-FP | 1½ | 16⅜ | 416 | 16½ | 419 | 6⅜ | 162 | 4 | 102 | 2⅜ | 60 | 11 5⁄16 | 287 | 6¼ | 159 | 2⅞ | 73 | 3⅜ | 86 | 18⅝ | 473 | 20.8 | 9.4 |
| 4000BM2-FP | 2 | 19⅛ | 486 | 19⅔ | 500 | 7 ½ | 191 | 4¼ | 108 | 3¼ | 83 | 13 7⁄16 | 341 | 6½ | 165 | 2⅞ | 73 | 3⅝ | 92 | 21⅜ | 543 | 30.4 | 13.8 |

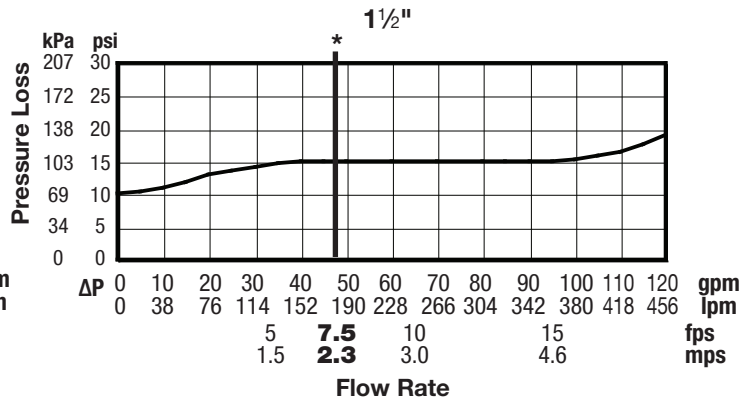
Strainer sold separately

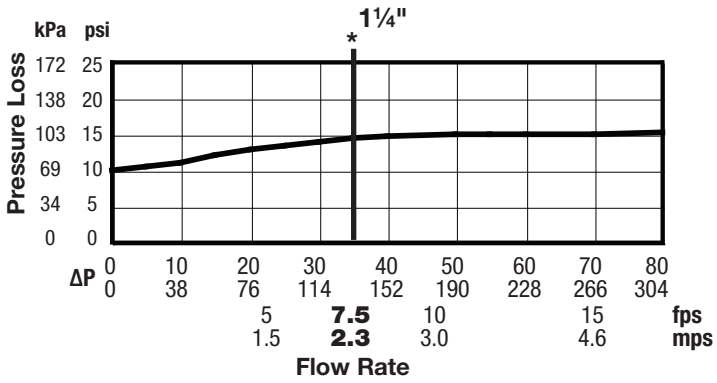
****Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.**

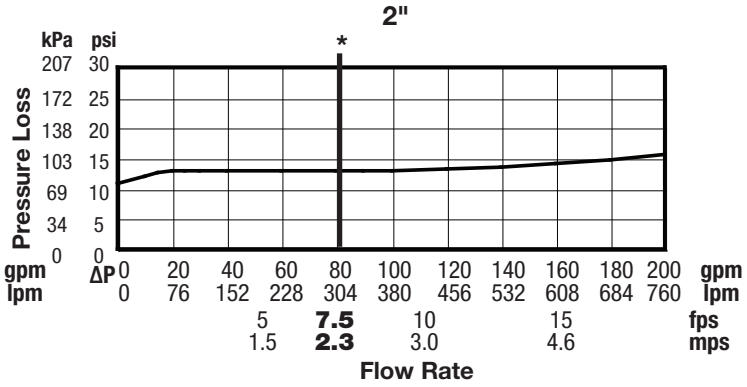
## Capacity

Performance as established by an independent testing laboratory.
*Typical maximum system flow rate (7.5 feet/sec., 2.3 meters/sec.)



## For additional information, visit our web site at: AmesFireWater.com

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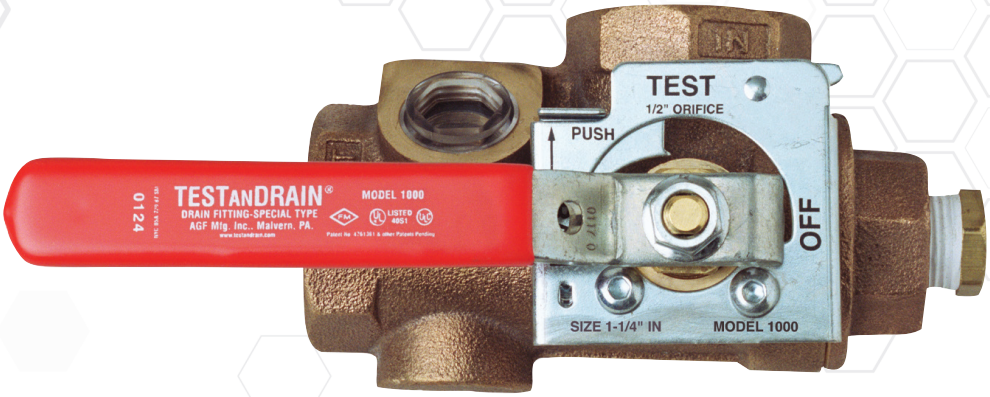
**USA: Control Valves** Tel: (713) 943-0688 • Fax: (713) 944-9445 • AmesFireWater.com
**Canada:** Tel: (905) 332-4090 • Fax: (905) 332-7068 • AmesFireWater.ca
**Latin America:** Tel: (52) 55-4122-0138 • AmesFireWater.com

ES-A-4000B-FP 1935

# TESTANDRAIN®

# Model 1000

QUALITY COMPONENTS FOR FIRE SPRINKLER SYSTEMS




## System Test and Express Drain Valve

The AGF TESTANDRAIN Model 1000 is a single-handle ball valve that provides the test and express drain functions for fire sprinkler systems. The single-handle ball valve configuration eliminates the multiple connections needed by traditional loop assemblies.

The Model 1000 is compliant with industry standards which require provisions for properly draining a system (NFPA 13, 13D, and 13R), is 400 PSI rated, includes a tamper-resistant test orifice, sight glass, and is available in a full range of sizes (¾"—2") with optional orifice sizes (2.8K—25.2K). TESTANDRAIN Model 1000 valves feature a plugged port for system access, are field-serviceable (repair kits sold separately), and offer locking kits for added security.

## Features

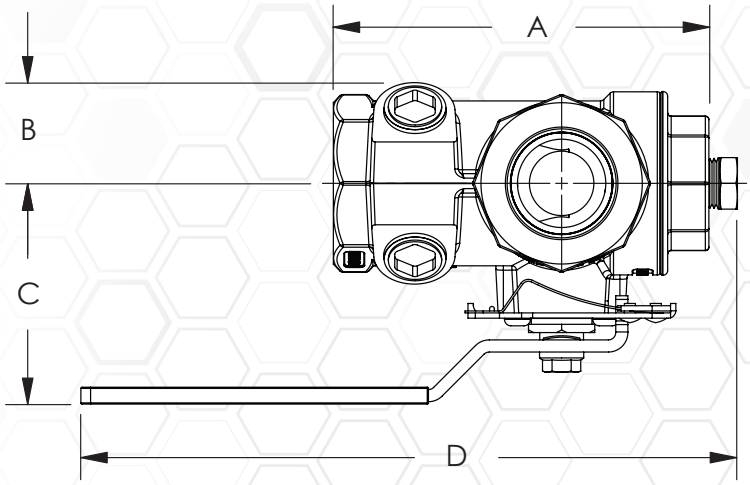
- NFPA Compliant (13, 13D, and 13R)
- ¾", 1", 1¼", 1½", and 2" Sizes
- Orifice Options (2.8K—25.2K) 4.9k
- Tamper-Resistant Test Orifice and Sight Glass
- Plugged System Access Port
- 400 PSI Rated
- Horizontal or Vertical Installation
- Field Serviceable
- Locking Kits Available

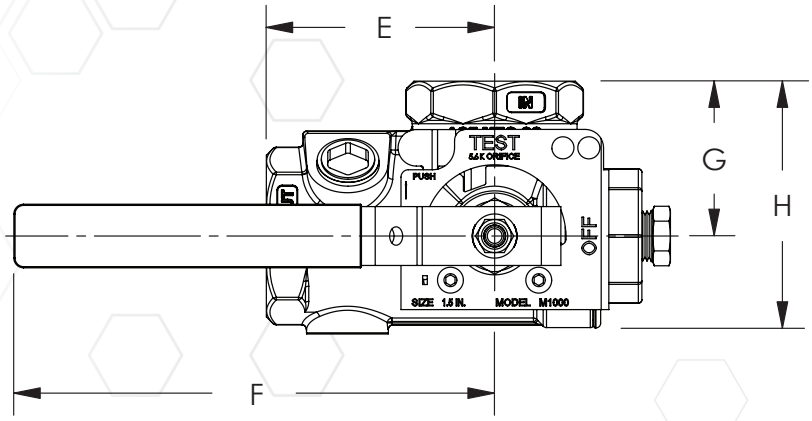
## Models

| Model 1000 Part Numbers | | | | | | |
|---|---|---|---|---|---|---|
| Orifice Size | | 3/4" | 1" | 1¼" | 1½" | 2" |
| K-Factor | Fractional | | | | | |
| 2.8 | 3/8" | 100 | 110 | 120 | 130 | 140 |
| 4.2 | 7/16" | 101 | 111 | 121 | 131 | 141 |
| 5.6 | 1/2" | 102 | 112 | 122 | 132 | 142 |
| 8.0 | 17/32" | 103 | 113 | 123 | 133 | 143 |
| 11.2 (ELO) | 5/8" | 104 | 114 | 124 | 134 | 144 |
| 14.0 (ESFR) | 3/4" | - | - | 125 | 135 | 145 |
| 25.2 | - | - | - | - | 136 | 146 |

Most Popular Models

## Dimensions




| Size | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| ¾" | 5" (128 mm) | 1⅜" (36 mm) | 2⅜" (60 mm) | 6¾" (171 mm) | 3⅜" (86 mm) | 4⅝" (116 mm) | 1¾" (44 mm) | 2⅞" (73 mm) |
| 1" | 5" (128 mm) | 1⅜" (36 mm) | 2⅜" (60 mm) | 6¾" (171 mm) | 3⅜" (86 mm) | 4⅝" (116 mm) | 1¾" (44 mm) | 2⅞" (73 mm) |
| 1¼" | 5⅜" (137 mm) | 1⅜" (36 mm) | 2¾" (71 mm) | 8" (204 mm) | 3⅜" (84 mm) | 5½" (139 mm) | 2" (50 mm) | 3¼" (84 mm) |
| 1½" | 6⅜" (162 mm) | 1¾" (43 mm) | 3¾" (95 mm) | 11⅛" (283 mm) | 3⅞" (98 mm) | 8⅛" (207 mm) | 2⅝" (67 mm) | 4¼" (109 mm) |
| 2" | 6⅜" (162 mm) | 1¾" (43 mm) | 3¾" (95 mm) | 11⅛" (283 mm) | 3⅞" (98 mm) | 8⅛" (207 mm) | 2⅝" (67 mm) | 4¼" (109 mm) |

Sizes have been rounded to the highest millimeter

USA Patent #4741361 and Other Patents Pending

For use on wet and dry fire sprinkler systems.

## Valve Sizes

¾", 1", 1¼", 1½", and 2"

## Orifice Options

2.8K, 4.2K, 5.6K, 8.0K, 11.2K (ELO), 14.0K (ESFR), and 25.2K

## Connections

Inlet..... NPT
Outlet..... NPT
(BSPT Available)

## Installation Orientation

Horizontal
Vertical

## Electrical Requirements

None

## Materials

Handle ..... Steel
Stem ..... Rod Brass
Ball..... C.P. Brass
Body ..... Bronze
Valve Seat..... Impregnated Teflon®
Indicator Plate ..... Steel

## Rating

400 PSI

## Compliance

NFPA 13, 13D, & 13R
NYC-BSA No. 720-87-SM

## Approvals

UL/ULC (EX4019 & EX4533)
FM

**AGF Manufacturing Inc.**
100 Quaker Lane, Malvern, PA 19355
Phone: 610-240-4900
Fax: 610-240-4906
**www.agfmfg.com**

**Job Name:** _____
**Architect:** _____
**Engineer:** _____
**Contractor:** _____

# T-Tap
# Waterflow Detectors

*System Sensor T-Tap Waterflow Detectors are designed for primary signaling in residential systems and branch line signaling in larger systems.*

## Features

- Sealed retard mechanism (Model WFDT)
- Visual switch activation (Model WFDT)
- Twelve different flexible plastic paddles
- Vertical or horizontal mount
- Durable, tamper-resistant enclosure
- Dual SPDT switches in durable terminal block
- Sizes marked on flexible plastic paddles
- 100 percent synchronization activates both alarm panel and local bell
- Accommodates up to 12 AWG wire

Both the WFDT retard model and the WFDTNR non-retard model fit any tee that has a 1˝ NPT branch, including: 1˝, 1¼˝, 1½˝ and 2˝ NPT threaded ferrous and brass tees; 1˝, 1¼˝, 1½˝ and 2˝ copper sweat tees; Tyco, Spears®, Victaulic® and NIBO brand 1˝ CPVC tees; and 1½˝ polybutylene tees.

**Design.** The design of the WFDT and WFDTNR makes them easy to install and simple to maintain. Either can be mounted in the vertical or horizontal position. Two conduit openings permit easy attachment to the local alarm system. The retard mechanism (Model WFDT only) and switch assemblies are field-replaceable.

**Features.** Twelve different flexible plastic paddles fit 1˝, 1¼˝, 1½˝ and 2˝ tees. Sizes are marked clearly on the paddles for ease of installation. Plastic paddles slip over the actuating lever and are securely fastened with one screw. The handy depth gauge ensures the proper installation depth and clearance of the detector to the tee.

**Construction.** The WFDT and WFDTNR include a durable, tamper-resistant enclosure and rugged switch assembly. The robust covers completely enclose the electrical components to keep out dust and dirt. Improved self-guiding security screws and removal tools make the detectors resistant to tampering and simplify field maintenance. Dual SPDT switches are enclosed in a durable terminal block for added strength.

## Agency Listings

UL LISTED S739 | ULC CS169 | 7770-1653:114 | MEA approved 167-93-E | FM APPROVED 3033305

# T-Tap Waterflow Detector Specifications

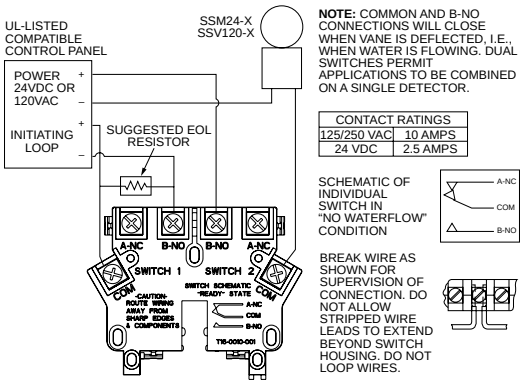
## Architectural/Engineering Specifications

Model shall be a WFDT or WFDTNR as manufactured by System Sensor. T-tap waterflow detectors shall be installed on a tee that has a 1˝ NPT branch including: 1˝, 1¼˝, 1½˝ or 2˝ threaded ferrous or brass tee; 1–2˝ copper sweat tees; Tyco, Spears,® Victaulic,® and NIBCO brand 1˝ CPVC tees; or 1½˝ polybutylene tee as designated on the drawings and/or as specified herein. Detectors shall mount on any clear pipe span of the appropriate size, either a vertical or horizontal run at least 6˝ from any fittings or valves that may change water direction, flow rate, or pipe diameter or no closer than 24˝ from a valve or drain. Detectors shall have a sensitivity in the range of 4 to 10 gallons per minute and a static pressure rating of 250 psi. The retard t-tap detector shall be a sealed mechanical pneumatic unit with visual indication of actuation. The actuation mechanism shall include a polyethylene vane inserted through the tee fitting and connected by a mechanical linkage to the delay mechanism. The non-retard t-tap detector shall respond with no time delay to waterflow in the specified direction and range. Outputs shall consist of dual SPDT switches (Form C contacts). Two conduit entrances (one of which is a knockout type) for standard fittings of commonly used electrical conduit shall be provided on the detectors. A grounding provision is provided. All detectors shall be listed by Underwriters Laboratories for indoor or outdoor use.

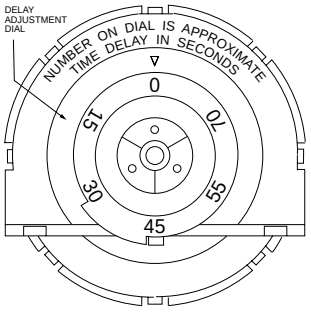
## Physical/Operating Specifications

| | | | |
|---|---|---|---|
| **Static Pressure Rating** | 250 PSI | **Operating Temperature Range** | 32°F to 120°F (0°C to 49°C) |
| **Maximum Surge** | 18 FPS | **Enclosure Rating** | UL indoor/outdoor rated |
| **Triggering Threshold Bandwidth (Flow Rate)** | 4–10 GPM | **Cover Tamper Switch** | UL models: optional P/N 546-7000<br>ULC/Canadian models: factory installed |
| **Overall Dimensions, Installed** | WFDT: 4.5˝ H × 3.75˝ W × 6.7˝ L<br>(11.4cm H × 9.5cm W × 17cm L)<br>WFDTNR: 3.75˝ H × 3.25˝ W × 4.25˝ L<br>(9.5cm H × 8.2cm W × 10.8cm L) | **Service Use** | Automatic Sprinkler: NFPA 13<br>One or Two Family Dwelling: NFPA 13D<br>Residential Occupancies up to 4 Stories: NFPA 13R<br>National Fire Alarm Code: NFPA 72 |
| **Contact Ratings** | Two sets of SPDT (Form C)<br>10.0 A @ 125/250 VAC<br>2.5 A @ 24 VDC | **Shipping Weight** | WFDT: 2.6 lbs. (1.2 kg.)<br>WFDTNR: 1.5 lbs. (0.7 kg.) |
| **Compatible Tee Fittings** | Threaded ferrous and brass tees, copper sweat tees, CPVC tees, and polybutylene tees | **Warranty** | 3 years |
| **Conduit Entrances** | Two openings for ½˝ conduit. | **U.S. Patent Numbers** | 5,213,205 |

# Electrical Connections for WFDT




# Delay Adjustment Dial




# Ordering Information

| UL Model | ULC Model | Description |
|---|---|---|
| WFDT | WFDTA | Waterflow Detector, Fits 1˝, 1¼˝, 1½˝, 2˝ ferrous and brass threaded tees; 1˝, 1¼˝, 1½˝, 2˝ copper sweat tees; 1˝ CPVC tees; and 1½˝ polybutylene tees |
| WFDTNR | — | Waterflow Detector, non-retard, fits same tees as Model WFDT |
| **Accessories** | **Description** | |
| A77-01-02 | Replacement terminal block for WFDT | |
| A77-01-08 | Replacement terminal block for WFDTNR | |
| A3008-00 | Replacement retard mechanism | |
| PRK9 | Replacement paddle kit – 12 paddles for WFDT and WFDTNR (see WFDT for sizes) | |
| 546-7000 | Cover tamper switch kit for WFDT | |
| S07-66-02 | Replacement tamper screws for covers of WFDT, WFDTNR | |
| WFDW | Replacement tamper-proof wrench for cover of WFDT, WFDTNR | |
| WFDN4 | NEMA-4 gasket kit | |
| C58-164-01 | Replacement metal cover | |
| C58-195-01 | Replacement plastic cover (WFDTNR) | |



SYSTEM SENSOR®
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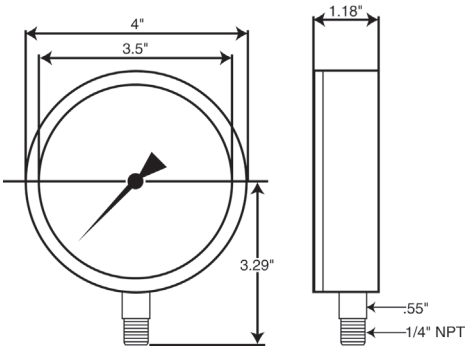
Phone: 800-SENSOR2 • Fax: 630-377-6495


A05-0195-014 • 7/10 • #2450

# FIRE PROTECTION GAUGES
## Plastic Back and Steel Back


**6510160: AIR/WATER 300 PSI**

**6510161: WATER 300 PSI**

**6510163: AIR 300 PSI**

**6510162: AIR WITH RETARD 250 PSI**

**Application:** Fluid medium which does not clog connection port or corrode copper alloy. Specifically designed for the fire sprinkler industry.

**Size:** 4" (100 mm)

**Accuracy** ± 3/2/3% of span (ASME B40.1 Grade B)

**Working Range**
Steady: 3/4 of full scale value
Fluctuating: 2/3 of full scale value
Short time: full scale value

**Operating Temperature**
Ambient: -40°F to 140°F (-40°C to 60°C)
Media: max. 140°F (+60°C)

**Temperature Error**
Additional error when temperature changes from reference temperature of 68°F (20°C) +0.4% for every 18° F (10°C) rising or falling. Percentage of span.

**ASSEMBLED IN U.S.A.**

**Approvals**
UL listed (UL-393)
FM approved
Meets NFPA 25 Standards

**Standard Scale**
PSI

**Window**
Acrylic, ultrasonically welded to case

**Standard Series** • Type 110.10sp

## Standard Features

**Connection** Material: copper alloy
Lower mount (LM) - not available for 1½" size
1/4" NPT limited to wrench flat area

**Bourdon Tube:** Material: copper alloy C-type

**Movement:** Copper alloy, silicone dampened

**Dia:** White plastic with stop pin - black & red lettering

**Pointer**: Black aluminum

**Case**: Black polycarbonate

**Order Options**
water
air/water
air

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| System No. | | Location | | Spec Section | | Paragraph | |
| Submitted By | | Date | | Approved | | Date | |

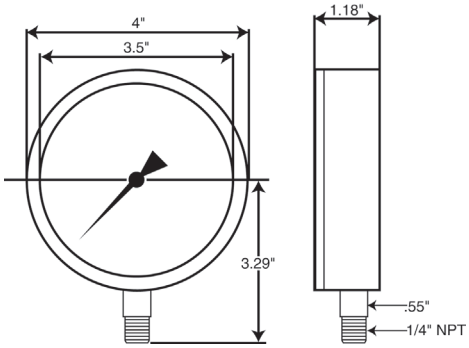
# FIRE PROTECTION GAUGES
## Black Steel Painted Case

**6510164STL: AIR/WATER 300 PSI**

**6510165STL: WATER 300 PSI**

**6510166STL: AIR 300 PSI**

**6510166STL: AIR WITH RETARD 250 PSI**

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Ambient: -40°F to 140°F (-40°C to 60°C)
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Additional error when temperature changes from reference temperature of 68°F (20°C) +0.4% for every 18° F (10°C) rising or falling. Percentage of span.

**ASSEMBLED IN U.S.A.**

**Approvals**
UL listed (UL-393)
FM approved
Meets NFPA 25 Standards

**Standard Scale**
PSI

**Window**
Acrylic, ultrasonically welded to case

**Standard Series** • Type 110.10sp

## Standard Features

**Connection** Material: copper alloy
Lower mount (LM) - not available for 1½" size
1/4" NPT limited to wrench flat area

**Bourdon Tube:** Material: copper alloy C-type

**Movement:** Copper alloy, silicone dampened

**Dia:** White plastic with stop pin - black & red lettering

**Pointer**: Black aluminum

**Case**: Black Painted Steel

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| System No. | | Location | | Spec Section | | Paragraph | |
| Submitted By | | Date | | Approved | | Date | |

# FIRE PROTECTION GAUGES
## Plastic Back and Steel Back


## NEMA and IP Ratings for Industrial Instrumentation

### NEMA Ratings

The NEMA Rating system is a standard primarily used in North America for rating enclosures. The table below shows the equivalent IP ratings. NEMA standards meet or exceed the IP ratings listed, but the reverse cannot be assumed.

| NEMA Rating | Description | Equiv. IP Rating |
|---|---|---|
| 1 | GENERAL PURPOSE. Intended for use indoors. | IP 10 |
| 2 | GENERAL PURPOSE. Intended for use indoors with additional drip protection. | IP 11 |
| 3 & 3S | GENERAL PURPOSE WEATHER-RESISTANT. Intended for use outdoors with protection from windblown dust, rain and sleet, and undamaged by the formation of ice. | IP 54 |
| 3R | GENERAL PURPOSE WEATHER-RESISTANT. Intended for use outdoors with protection from falling rain an sleet, and undamaged by the formation of ice. | IP 14 |
| 4 & 4X | GENERAL PURPOSE WEATHER-PROOF. Intended for use indoors or out doors with protection from wash down environment and corrosion resistance. | IP 65 |
| 5 | GENERAL PURPOSE DUST-TIGHT. Intended for use indoors or outdoors with protection from dust provided by gaskets. | IP 52 |
| 6 & 6P | GENERAL PURPOSE SUBMERSIBLE. Intended for use indoors or outdoors with protection from occasional submersion. | IP 67 |
| 7 | HAZARDOUS. Intended for indoor use in Class I, Groups A, B, C, and D environments per NFPA rating system. | |
| 8 | HAZARDOUS. Intended for indoor or outdoor use in Class I, Groups A, B, C, and D environments per NFPA rating system. | |
| 9 | HAZARDOUS. Intended for indoor or outdoor use in Class II, Groups E, F, and G environments per NFPA rating system. | |
| 12 & 12K | INDUSTRIAL USE. Intended for use in industrial applications with protection from dust and non corrosive liquid drip. | IP 52 |
| 13 | INDUSTRIAL USE. Intended for use in industrial applications with protection from dust, spraying water, oil and non corrosive liquid drip. | IP 54 |

# NEMA and IP Ratings for Industrial Instrumentation

## IP Ratings

The IP Rating system (or International Protection Code) is a worldwide standard for rating enclosures. The rating is written as IP-"XY" where X and Y are replaced by the first and second digits as listed in the tables below.

**Degree of protection from contact or foreign body**

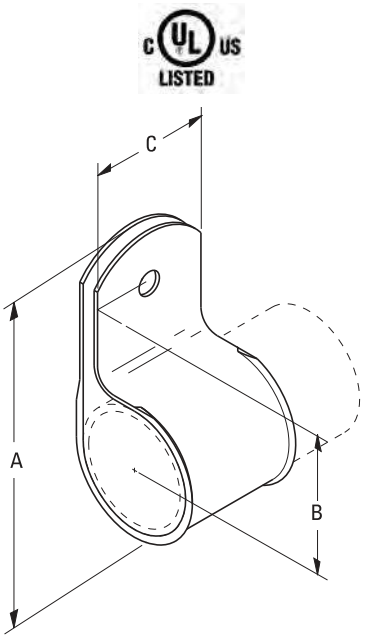
| First Digit | Brief Description |
|---|---|
| 0<br>1<br>2 | No special protection. Generally not used for pressure or temperature instruments. |
| 3 | Protected against solid objects > 2.5 mm in diameter |
| 4 | Protected against solid objects > 1.0 mm in diameter |
| 5 | Dust protected |
| 6 | Dust-tight |

**Degree of water protection**

| Second Digit | Brief Description |
|---|---|
| 0 | No special protection. Generally not used for pressure or temperature instruments. |
| 1 | Protected against dripping water |
| 2 | Protection against dripping water when case is tilted up to 15° |
| 3 | Protected against spraying water |
| 4 | Protected against splashing water |
| 5 | Protected against a water jet |
| 6 | Protected against heavy jet spray |
| 7 | Protected against limited submersion |
| 8 | Protected against continuous submersion |

## TOLCO™ Fig. 22 - Hanger for CPVC Plastic Pipe Single Fastener Strap




**Size Range:** 3/4" (20mm) thru 2" (50mm) CPVC pipe

**Material:** Pre-Galvanized Steel

**Function:** Intended to perform as a hanger to support CPVC piping used in automatic fire sprinkler systems. The product acts as a hanger when tab is upward and the fastener screw is in the horizontal position. Fig. 22 can be installed on the top of a beam, but in this situation acts as a guide to the piping which is supported by the beam itself. It is not intended to support CPVC pipe from under a flat horizontal surface, such as a ceiling.

**Approvals:** Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.9mm) steel using (1) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

**Features:** Fig. 22 incorporates features which protect the pipe and ease installation. The flared edge design protects CPVC pipe from any rough surface. It is easily attached to the building structure using the special UL Listed hex head self threading screw* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment to be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

**Finish:** Pre-Galvanized

**Order By:** Part number and CPVC pipe size.

* Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.

| Part No. | CPVC Pipe Size in. | (mm) | A in. | (mm) | B in. | (mm) | C in. | (mm) | Max. Hanger Spacing Ft. | (m) | Fastener Hex Head Size in. | (mm) | Approx. Wt./100 Lbs. | (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **22-3/4** | 3/4" | (20) | 2 7/16" | (61.9) | 1 5/16" | (33.3) | 1 3/16" | (30.2) | 5 1/2 | (1.67) | 5/16" | (7.9) | 9 | (4.1) |
| **22-1** | 1" | (25) | 2 11/16" | (68.3) | 1 7/16" | (36.5) | 1 3/16" | (30.2) | 6 | (1,83) | 5/16" | (7.9) | 9 | (4.1) |
| **22-1 1/4** | 1 1/4" | (32) | 3 1/16" | (77.8) | 1 5/8" | (42.3) | 1 3/16" | (30.2) | 6 1/2 | (1.98) | 5/16" | (7.9) | 11 | (5.0) |
| **22-1 1/2** | 1 1/2" | (40) | 3 5/16" | (84.1) | 1 3/4" | (44.4) | 1 3/16" | (30.2) | 7 | (2.13) | 5/16" | (7.9) | 12 | (5.4) |
| **22-2** | 2" | (50) | 3 3/4" | (95.2) | 2 1/8" | (54.6) | 1 3/16" | (30.2) | 8 | (2.44) | 5/16" | (7.9) | 15 | (6.8) |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO™ Fig. 23 - Hanger for CPVC Plastic Pipe Double Fastener Strap

**Size Range:** 3/4" (20mm) thru 3" (80mm) CPVC pipe

**Material:** Pre-Galvanized Steel

**Function:** Intended to perform as a hanger to support CPVC piping used in automatic fire sprinkler systems. Fig. 23 can be installed on the top, bottom or side of a beam.

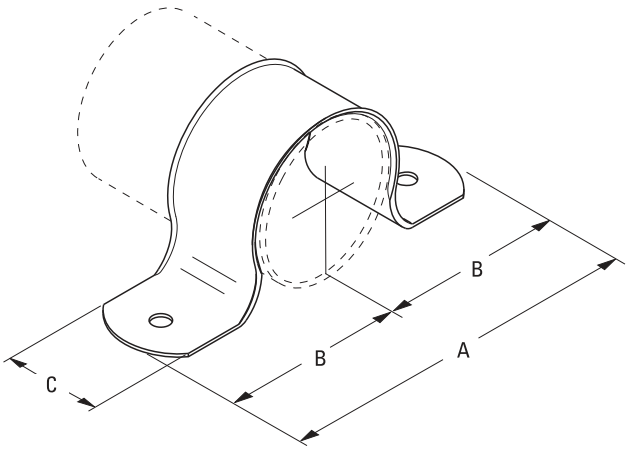
**Approvals:** Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** sizes 3/4" (20mm) thru 2" (50mm) to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.9mm) steel using (2) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

**Features:** Fig. 23 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. It also incorporates snap restrainers allowing easier and faster installation. Easily attaches to the building structure using the two UL Listed hex head self threading screws* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

**Finish:** Pre-Galvanized

**Order By:** Part number and pipe size

* Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.




| Part No. | CPVC Pipe Size in. | (mm) | A in. | (mm) | B in. | (mm) | C in. | (mm) | Max. Hanger Spacing Ft. | (m) | Fastener Hex Head Size in. | (mm) | Approx. Wt./100 Lbs. | (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23-3/4 | 3/4" | (20) | 3 1/8" | (79.4) | 1 9/16" | (39.7) | 1 3/16" | (30.2) | 5 1/2 | (1.67) | 5/16" | (7.9) | 9 | (4.1) |
| 23-1 | 1" | (25) | 3 3/8" | (85.7) | 1 11/16" | (42.9) | 1 3/16" | (30.2) | 6 | (1,83) | 5/16" | (7.9) | 9 | (4.1) |
| 23-1 1/4 | 1 1/4" | (32) | 4 3/16" | (106.4) | 2 3/32" | (53.1) | 1 3/16" | (30.2) | 6 1/2 | (1.98) | 5/16" | (7.9) | 11 | (5.0) |
| 23-1 1/2 | 1 1/2" | (40) | 4 7/16" | (112.7) | 2 7/32" | (56.3) | 1 3/16" | (30.2) | 7 | (2.13) | 5/16" | (7.9) | 12 | (5.4) |
| 23-2 | 2" | (50) | 4 7/8" | (123.8) | 2 7/16" | (61.9) | 1 3/16" | (30.2) | 8 | (2.44) | 5/16" | (7.9) | 15 | (6.8) |
| 23-2 1/2 | 2 1/2" | (65) | 5 3/8" | (136.5) | 2 11/16" | (68.3) | 1 3/16" | (30.2) | Consult Factory | | 5/16" | (7.9) | 22 | (10.0) |
| 23-3 | 3" | (80) | 6" | (152.4) | 3" | (76.2) | 1 3/16" | (30.2) | Consult Factory | | 5/16" | (7.9) | 25 | (11.3) |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

## TOLCO™ Fig. 24 - Hanger for CPVC Plastic Pipe Double Fastener Strap Side Mounted

**Size Range:** 3/4" (20mm) thru 2" (50mm) CPVC pipe

**Material:** Pre-Galvanized Steel

**Function:** Intended to perform as a hanger to support CPVC piping used in automatic fire sprinkler systems. Can be installed on the top or on the bottom of a beam.

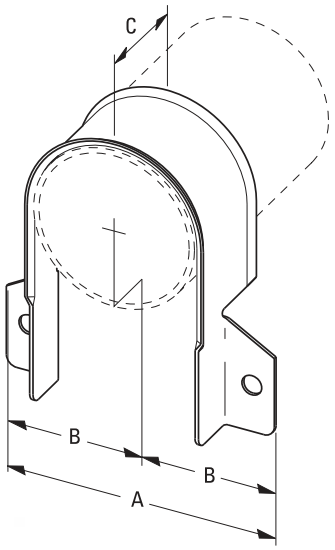
**Approvals:** Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.912mm) steel using (2) 1/4" x 1" tek type screws. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

**Features:** Fig. 24 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. Easily attaches to the building structure using the two UL Listed hex head self threading screws* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

**Finish:** Pre-Galvanized

**Order By:** Part number and pipe size

* Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.




| Part No. | CPVC Pipe Size in. | (mm) | A in. | (mm) | B in. | (mm) | C in. | (mm) | Max. Hanger Spacing Ft. | (m) | Fastener Hex Head Size in. | (mm) | Approx. Wt./100 Lbs. | (kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 24-3/4 | 3/4" | (20) | 2 5/16" | (58.7) | 1 5/32" | (27.8) | 1 3/16" | (30.2) | 5 1/2 | (1.67) | 5/16" | (7.9) | 9 | (4.1) |
| 24-1 | 1" | (25) | 2 5/8" | (66.7) | 1 5/16" | (33.3) | 1 3/16" | (30.2) | 6 | (1,83) | 5/16" | (7.9) | 9 | (4.1) |
| 24-1 1/4 | 1 1/4" | (32) | 3" | (76.2) | 1 1/2" | (38.1) | 1 3/16" | (30.2) | 6 1/2 | (1.98) | 5/16" | (7.9) | 11 | (5.0) |
| 24-1 1/2 | 1 1/2" | (40) | 3 1/4" | (82.5) | 1 5/8" | (42.3) | 1 3/16" | (30.2) | 7 | (2.13) | 5/16" | (7.9) | 12 | (5.4) |
| 24-2 | 2" | (50) | 3 11/16" | (93.7) | 1 27/32" | (43.6) | 1 3/16" | (30.2) | 8 | (2.44) | 5/16" | (7.9) | 15 | (6.8) |



All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.