

Window Sprinkler™

Specific Application

Model WS™

Horizontal Sidewall

Pendent Vertical Sidewall Automatic Sprinkler

Manufactured by: Central Sprinkler Company
451 North Cannon Avenue, Lansdale, Pennsylvania 19446

Product Description

The Central Model WS™ Window Sprinkler is the first sprinkler ever to be specifically Listed to provide protection for heat strengthened or tempered glass windows using closed sprinklers. As part of the testing, the gas flow required to achieve the time/temperature relationship specified in ASTM E119 was maintained for two hours and the window maintained integrity without visible damage or cracking. These sprinklers were tested in accordance with the Canadian Construction Materials Centre Technical Guide for Sprinkler Protected Glazing Systems. The Model WS™ is the only listed option to protect the integrity of an interior window.

The Model WS™ Window Sprinklers incorporate specially designed deflectors that ensure that the spray pattern wets the entire surface of the window.

The Window Sprinkler can be used as interior protection of windows or glazing in a sprinklered building or non sprinklered building. Also, the Model WS™ can be used as an exterior sprinkler for exposure protection.

The Model WS™ is a quick response pendent or sidewall sprinkler that is available in either 155°F or 200°F. As with any specific application sprinkler, follow the installation instructions included in this data sheet.

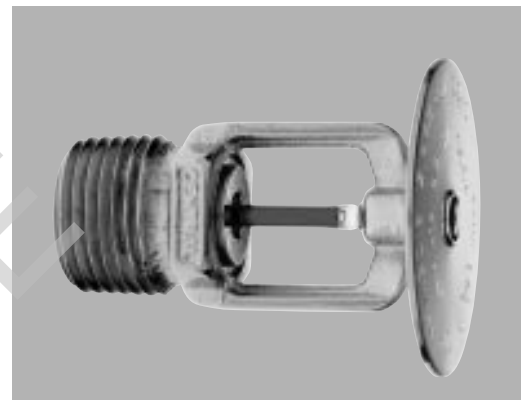
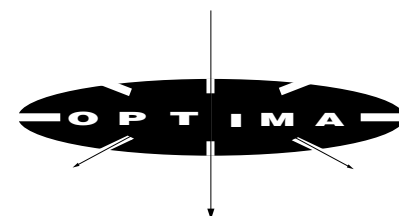
Note: If NES and CCMC guidelines apply, consult the specific approval report.

The Model WS™ is available in three standard finishes, brass, chrome plated and white painted.

Technical Data

Model: WS™
Style: Horizontal Sidewall & Pendent Vertical Sidewall
Wrench: Combination Wrench #1106
Orifice Size: 1/2" (12.7 mm)
K-Factor: 5.6 (80.08)
Thread Size: 1/2" (12.7 mm) N.P.T.
Temperature Rating: 155°F/68°C
200°F/93°C
Approvals: U.L., C-UL, MEA #191-96-E
Additional Approvals and Recognition:
NES (National Evaluation Service Representing I.C.B.O., B.O.C.A. and S.B.C.C.I); and CCMC (Canadian Construction Materials Center Representing Canadian Approval)
Factory Hydro Test: 100% at 500 psi
Standard Finishes:
Sprinkler: brass, chrome plated, white painted
Escutcheon: brass, chrome plated, white painted

	<i>Horizontal Sidewall</i>	<i>Pend. Vert. Sidewall</i>
Length:	2" (50.8 mm)	2" (50.8 mm)
Width:	1 5/8" (41.3 mm)	2" (50.8 mm)
Weight:	3.5 oz. (99 g.)	2.0 oz. (56.7 g.)
Patent:	Pending	
Response:	Quick	



1/2" Horizontal Sidewall & Pendent Vertical Sidewall Sprinkler



Specific Application Guidelines

Area of Use: At windows that are part of rated walls when acceptable to the Authority Having Jurisdiction, or at windows that need exposure protection.

Hazard: Heat-strengthened glass, tempered glass or any stronger glass applicable to any occupancy.

Maximum Window Span: Unlimited

Maximum Window Height: 13'-0" (3960 mm) See Figure F & G.

Minimum Clearance From Face of Glass:

All combustible materials shall be kept 2" (50.8 mm) from the face of the glass. This can be accomplished by a 36" (.91 M) pony wall or any other method acceptable to the Authority Having Jurisdiction.

Maximum Distance Between Window Sprinklers: 8'-0" (2.44 M) See Figure C & D.

Minimum Distance Between Window Sprinklers: 6'-0" (1.83 M) See Figure C & D, unless separated by a mullion or baffle.

Minimum Distance from Standard Sprinklers: 6'-0" (1.83 M) unless separated by a baffle.

Minimum Flow per Sprinkler:

	Flow	PSI
6'-0" to 8'-0" (1.83 M to 2.44 M)	20 gpm (75.7 L)	12.7 psi
Less than 6'-0"* (1.83M)	15 gpm (56.8 L)	7.0 psi

Maximum Pressure Per Sprinkler:

Horizontal Sidewall = *70 psi

Vertical Sidewall = 175 psi

* The 70 psi is only for cold solder purposes. If there is a baffle or mullion separating the sprinkler, the maximum pressure is 175 psi.

Test Pressure: All sprinklers are factory hydrostatically tested at 500 psi. System testing per NFPA is done at 200 psi.

System Type: Wet, single interlock preaction or deluge.

Sprinkler Location:

Butt Jointed Glazing Assemblies - Locate window sprinklers on maximum 8'-0" (2.44 M) centers. See Figure D.

Mullioned Glazing Assemblies - Locate window sprinklers within each mullioned glazing segment. See Figure C.

Sprinkler Data: See Page 1

Hydraulic Requirements: In all cases, the Authority Having Jurisdiction is to be consulted to determine the hydraulic requirements for each installation. The following are suggested minimum hydraulic requirements.

Interior Protection Sprinklered Building - In a sprinklered building, calculate the most demanding window sprinklers along one side of the wall. The length along the wall to be calculated is a minimum of 1.2 x the square root of the system area of operation. For example, $1.2 \sqrt{1500} = 46.5'$ ($1.2 \sqrt{139 M^2} = 14.2 M$). In the event this exceeds the total length of the window sprinklers along the wall, calculate all sprinklers along the most demanding wall.

Interior Protection Non-Sprinklered - Calculate all the sprinklers on the most demanding side of the glazing assembly within the enclosure.

Exposure Protection - Calculate all sprinklers facing the exposure. If open sprinklers are used, calculate all sprinklers controlled by the deluge valve.

Maximum Distance from Mullion: Half the maximum distance between sprinklers. See Figure C.

Intermediate Horizontal Mullions: Not tested with and not Listed for. See Figure E.

Type of Window Frame/Mullion: Noncombustible.

Sprinkler Location for Exposure Protection: One side of glass. See Figure B.

Sprinkler Location for an Interior Wall: On both sides of the glass. See Figure A.

Deflector Location: Deflectors are located as follows without respect to the ceiling:

Horizontal Sidewall - Locate within the outside edge of the window frame from 1/2" to 4" (12.7 mm to 101.6 mm) away from the glass and 2" ±1" (50.8 mm ±25.4 mm) down from the top of exposed glass. See Figure F.

Vertical Sidewall - Locate 4" to 12" (101.6 mm to 304.8 mm) from the face of the glass and 3" ±1" (76.2 mm ±25.4 mm) down from the top of exposed glass. See Figure G.

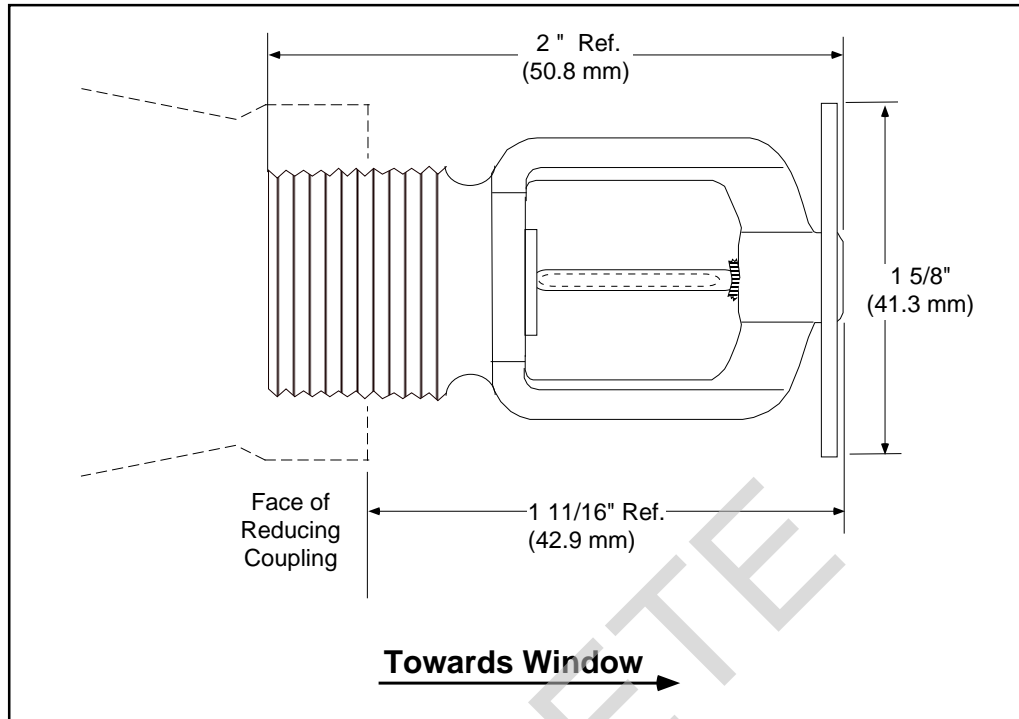


Testing

The Model WS Window Sprinklers are the first sprinklers ever to be Listed for protecting interior windows. As a part of the testing of these sprinklers, the gas flow required to achieve a time/temperature relationship specified in ASTM E119 was established in the test furnace without sprinkler protection. A window assembly with sprinklers was then installed in the test furnace and the same gas flow conditions maintained for a two hour test period. No cracking or visible damage to the window was permitted during the test period.

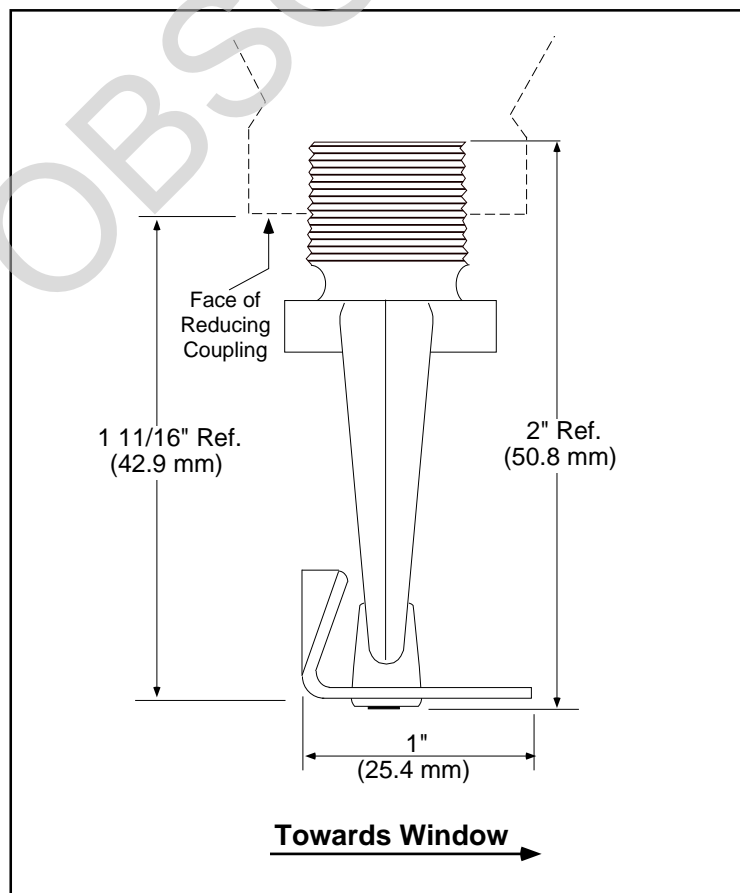
The success of the Window Sprinkler is due to the full wetting of the glass and the quick response element. Test results indicated glass protected by Window Sprinklers maintained the ambient temperature even though the area just beyond the spray pattern was at 1,832°F (1,000°C). 2

Figure 1
WS™ Horizontal Sidewall Window Sprinkler



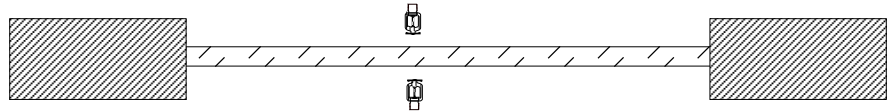
Installation Note: Frame arms must be in vertical alignment.

Figure 2
WS™ Pendent Vertical Sidewall Window Sprinkler



Operation: The glass bulb capsule operating mechanism contains a heat-sensitive liquid that expands upon application of heat. At the rated temperature, the frangible capsule ruptures, thereby releasing the orifice seal. The sprinkler then discharges water in a pre-designed spray pattern to control or extinguish the fire.

Figure A



In maintaining the integrity of a window, Window Sprinklers need to be installed on both sides of the glass.

Design Guidelines

To design the Window Sprinkler into a project, follow these steps:

- Decide which walls have windows that need to be protected.
- Determine if the pendent or sidewall version is to be used. Consider the following in this determination:

How far away from the glass is the sprinkler going to be located?
 If 1"-4" (25.4 mm to 101.6 mm), choose the horizontal sidewall. If over 4" (101.6 mm), choose the pendent vertical sidewall

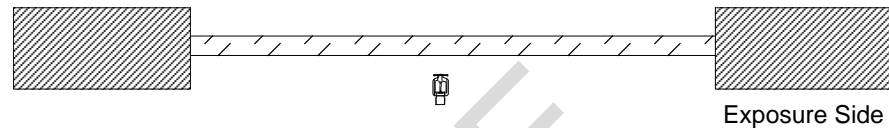
- Determine the location of the sprinkler in relation to the window. Consider the following:

If the window is so wide it requires more than one sprinkler, be sure not to space the sprinklers closer than 6 feet apart.

Is the glass framed into noncombustible mullions or butt jointed together?

If butt jointed, space sprinklers at the maximum spacing for the hydraulic flow chosen (see hydraulic requirements on page 2. For example, a long window of butt jointed glass could be spaced at 8'-0" (2.44 M) on center.

Figure B



In exposure protection, Window Sprinklers need to be installed on one side protecting against the exposure.

If framed into noncombustible mullions, check to be sure that there are no horizontal mullions (see figure E). If so, window sprinklers cannot be used. If not, consider each mullion as a barrier and locate window sprinklers no more than ½ the calculated distance from the face of each side of the mullion (see figure D).

Hydraulic Calculations:

Determine if the window sprinklers are in a fully sprinklered building or unsprinklered building. Calculate accordingly. See Design Data on page 2.



Installation

All Central Model WS™ Window Sprinklers must be installed according to current NFPA Standards, these installation instructions and the Local Authority Having Jurisdiction. Deviations from these requirements and standards or any alteration to the sprinkler itself will void any warranty made by Central Sprinkler Company. In addition, installation must also meet local government provisions, codes, and standards as applicable.

The system piping must be properly sized to ensure the minimum required flow rate at the sprinkler. Check for the proper model, style, orifice size, and temperature rating prior to installation. Install sprinklers after the piping is in place to avoid mechanical damage; replace any damaged units.

Wet pipe systems must be protected from freezing. Upon completion of the installation, the system must be tested per recognized standards.

In the event of a thread leak, remove the unit, apply new pipe joint compound or tape, and reinstall.

Installation Sequence

Step 1. The unit must be installed per specified guidelines.

Step 2. Use only a non-hardening pipe joint compound or Teflon* tape. Apply only to the male threads.

*Teflon is a trademark of the DuPont Corp.

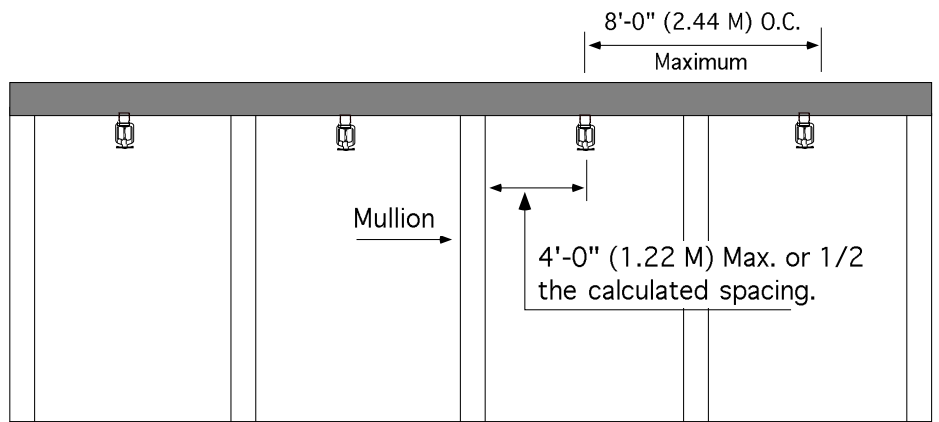
Step 3. Hand tighten the sprinkler into the fitting. Use a Central Sprinkler Wrench, to tighten the unit into the fitting. A leak-tight joint requires only 7 to 14 ft.-lbs. of torque; a tangential force of 14 to 28 lbs. delivered through a 6" handle will deliver adequate torque. Torque levels over 21 ft.-lbs. may distort the orifice seal, resulting in leakage.

Caution: Special care must be taken when installing with a CPVC system. Sprinklers must be installed after the manufacturer's recommended setting time for the primer and cement to ensure that neither accumulate within the sprinkler.

Special care must be taken when installing with a copper system. Sprinklers must be installed only after the inside of the sprinkler drop and associated fittings have been wire brushed to remove any flux. Residual flux can cause corrosion and in extreme cases can impair proper sprinkler operation.

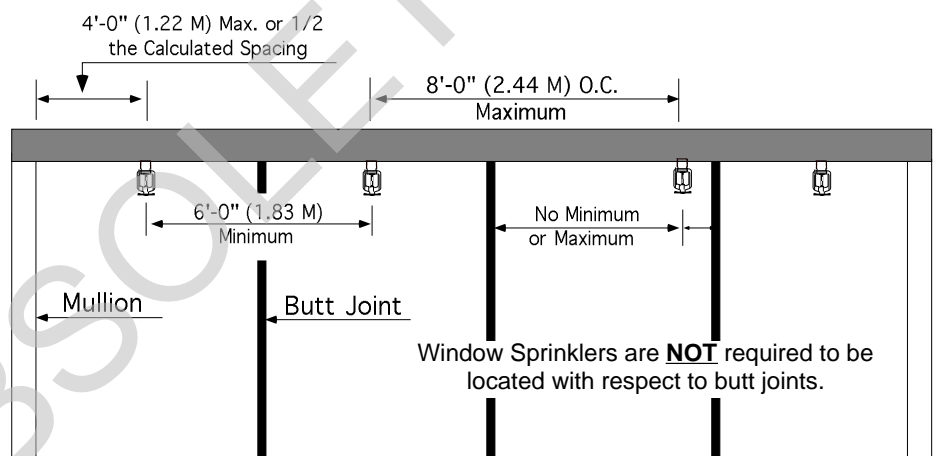
Combination Wrench (Part #1106)

Figure C



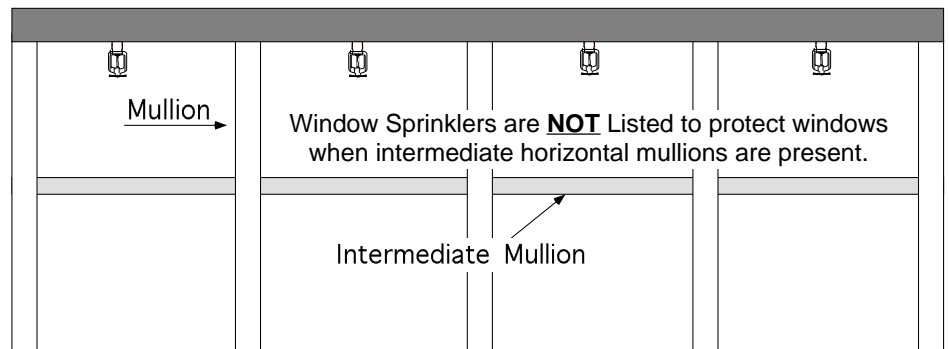
Multiple windows separated by mullions.

Figure D



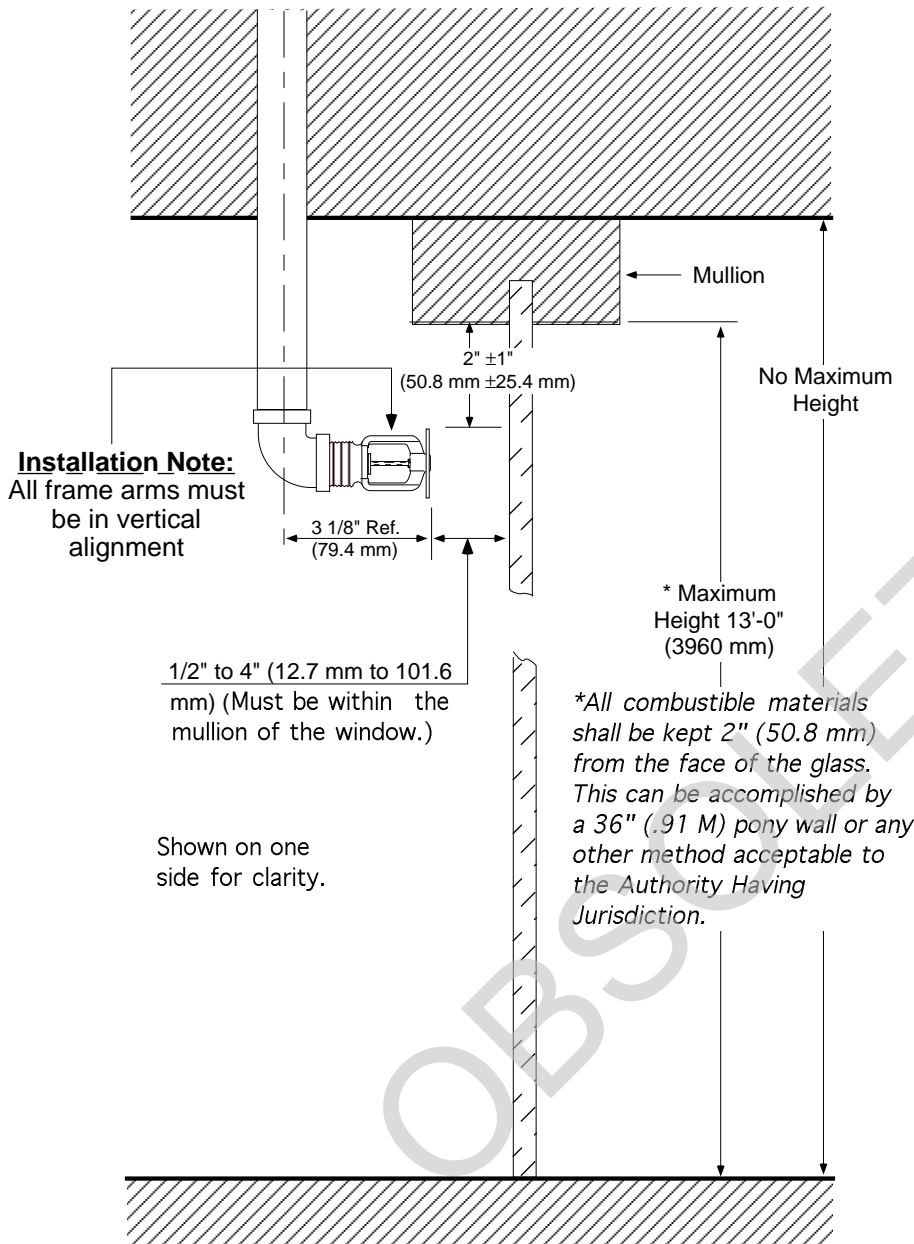
Multiple windows separated by butt joints.

Figure E



Windows with horizontal mullions.

Figure F
WS™ Horizontal Sidewall



Care & Maintenance

Sprinklers must be handled carefully. They must not be transported or stored where ambient temperature may exceed recommended NFPA limits. For 155°F/74°C sprinklers, this temperature is 100°F/38°C. For best results, store them in a dry, cool location in the original shipping package.

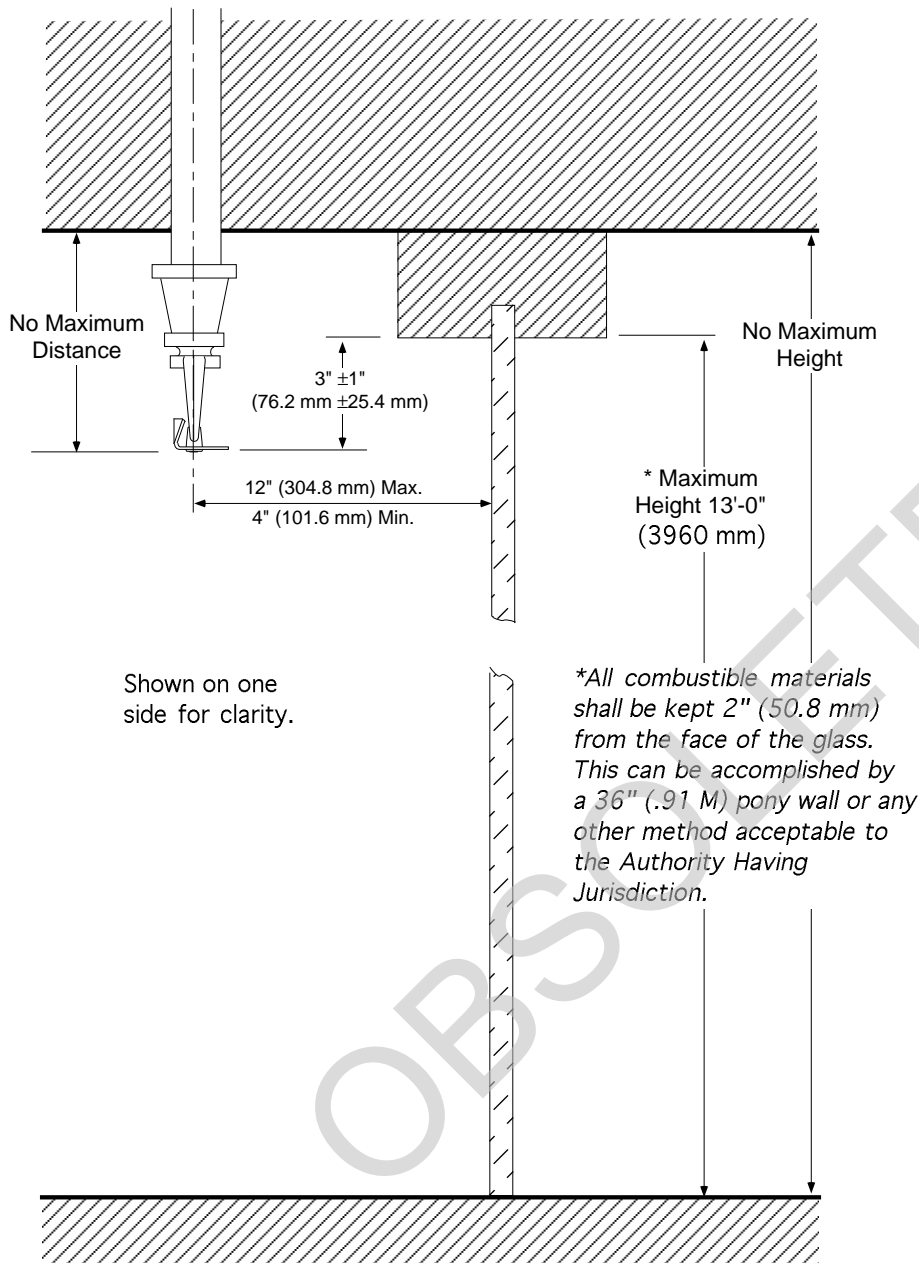
Do not install sprinklers that have been dropped or visibly damaged. Sprinklers must never be painted, coated, plated, or altered in any other way from manufactured condition or they may not function properly. Any sprinklers altered in such manner must be replaced.

The owner is responsible for the proper operating condition of all fire protection devices and accessories. The NFPA standard 25 entitled, "Inspection, Testing and Maintenance of Water-Based Fire Protection Systems", contains guidelines and minimum maintenance requirements. Furthermore, the local Authority Having Jurisdiction may have additional regulations and requirements for maintenance, testing, and inspection that must be obeyed.

It is advisable to have sprinkler systems inspected regularly by a qualified inspection service. Length of time between such inspections can vary due to accessibility, ambient atmosphere, water supply, and site activity.

Do not attempt to reassemble or otherwise reuse a sprinkler that has operated. Replace any sprinkler exhibiting corrosion or damage; always use new sprinklers of the same type and temperature rating as replacements.

Figure G
WS™ Pendent Vertical Sidewall Sprinkler



Because the discharge pattern is critical to protection of life and property, nothing should be hung or attached to the sprinkler unit that would disrupt the pattern. Such obstructions must be removed. In the event that construction has altered the original configuration, additional sprinklers should be installed to maintain the protection level.

Do not attempt to replace sprinklers without first removing the fire protection system from service. Be certain to secure permission from all authorities having jurisdiction, and notify all personnel who may be affected during system shutdown. A fire watch during maintenance periods is a wise precaution.

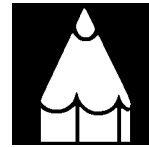
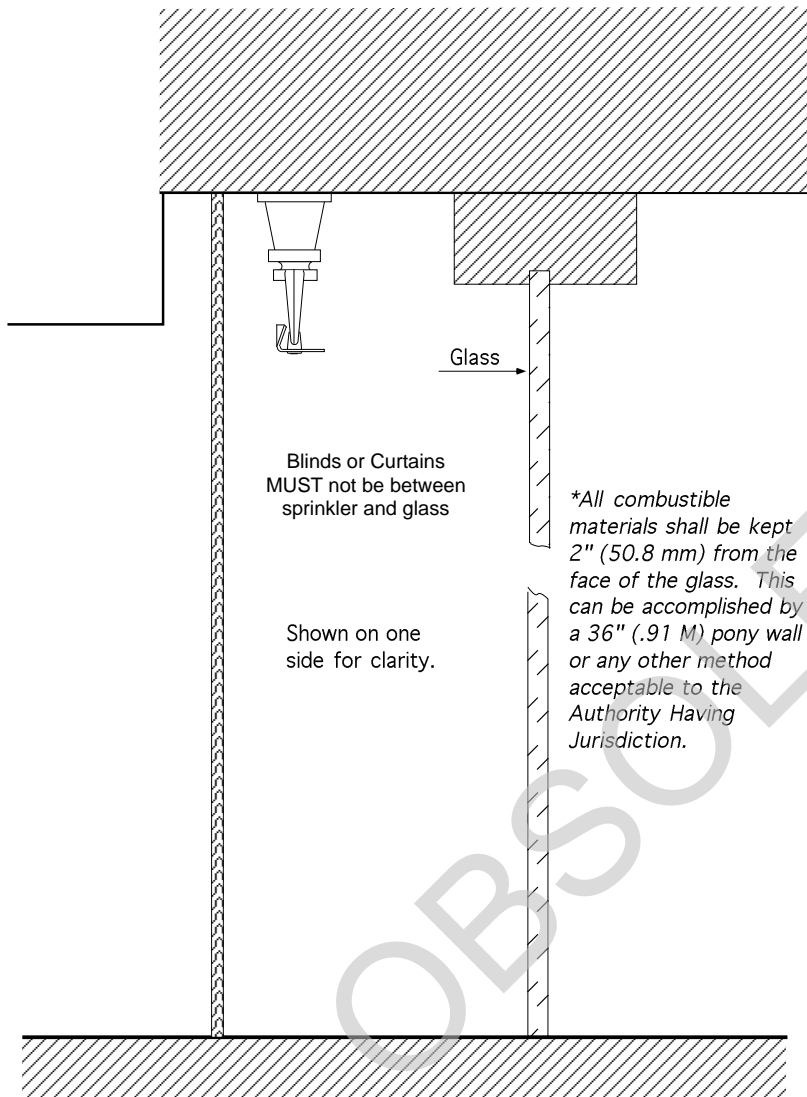
To remove the system from service mode, first refer to the system operating guide and valve instruction. Drain water and relieve pressure in the pipes. Remove the existing unit and install the replacement, using only the special sprinkler wrench. Be certain to match model, style, orifice, and temperature rating.

A fire protection system that has been shut off after an activation should be returned to service immediately. Inspect the entire system for damage and replace or repair as necessary. Sprinklers that did not operate but were subjected to corrosive elements of combustion or excessive temperatures should be inspected, and replaced if need be. The *Authority Having Jurisdiction* will detail minimum replacement requirements and regulations.

Guarantee: Central Sprinkler Company will repair and/or replace any products found to be defective in material or workmanship within a period of one year from the date of shipment. Please refer to the current Price List for further details of the warranty.

Figure H
Recessed Ceiling Condition

Window Sprinklers can be installed into recessed ceiling spaces. Curtains, blinds or other window coverings are **NOT** to be located between the sprinkler and the window.



Ordering Information

Ordering Information: When placing an order, indicate the full product name. Please specify the quantity, model, style, orifice size, temperature rating, type of finish or coating, and sprinkler wrench.

Availability and Service: Central sprinklers, valves, accessories, and other products are available throughout the U.S. and Canada, and internationally, through a network of Central Sprinkler distribution centers. You may write directly to Central Sprinkler Company, or call (215) 362-0700 for the distributor nearest you.

Patents: Patents are pending.

Conversion Table:

1 inch	= 25.400 mm
1 foot	= 0.3048 M
1 pound	= 0.4536 kg
1 foot pound	= 1.36 Nm
1 psi	= 6.895 kpa
	= 0.0689 bar
	= 0.0703 kg/cm ²
1 U.S. gallon	= 3.785 dm ³
	= 3.785 liters

Conversions are approximate.



Central Sprinkler Company

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