Bulletin 013 November 2019

Reliable®

Models F1 Series Standard Response Sprinklers

Model F156 Sprinkler Types
Standard Upright
Standard Pendent
Conventional
Vertical Sidewall
Horizontal Sidewall

Model F156 Recessed Sprinkler Types
Pendent/F1/F2/FP
Horizontal Sidewall

Model F142, F1XLH & F128 Sprinkler Types
Standard Upright
Standard Pendent

Model F142, F1XLH & F128 Recessed Sprinkler Types
Pendent/F1/F2/FP

Approval Organizations
1. Underwriters Laboratories Inc. and certified for Canada (cULus)
2. Factory Mutual Approvals (FM)
3. Loss Prevention Council (LPCB, UK)
4. VdS Schadenverhütung GmbH
5. EC Certificate: 0786-CPD-40237 (RA1314)
   0786-CPD-40253 (RA1325)
   0786-CPD-40254 (RA1375)

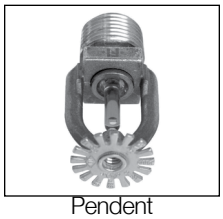
UL Listing Category
Sprinklers, Automatic & Open (VNIV)

Product Description
The F156, F142, F1XLH & F128 Series Glass Bulb Sprinkler combines the durability of a standard sprinkler with the attractive low profile of a decorative sprinkler. Whether installed on exposed piping or in an office ceiling, it is functional and attractive.

Beautifully versatile is the description for the Reliable Models F156, F142, F1XLH & F128 Series Recessed glass bulb sprinkler. Recessing the F156, F142, F1XLH & F128 Series enhances its already low profile decorative appearance, and facilitates a rapid and perfect installation.

The recessed escutcheon of the Models F156, F142, F1XLH & F128 are highly adjustable. The two piece construction makes field installation a very easy and rapid task. This also allows ceiling panels to later be removed without shutting down the fire protection system, thus facilitating maintenance of above ceiling services.


Upright

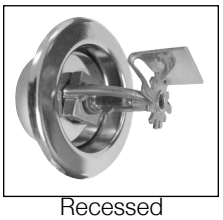

Pendent

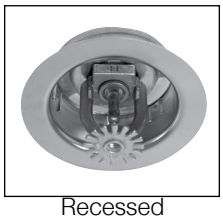

Conventional


Vertical Sidewall


Horizontal Sidewall


Recessed Pendent/F1/F2


Recessed Horizontal Sidewall


Recessed Pendent/FP


XLH Upright


XLH Pendent


XLH Recessed Pendent F1/F2

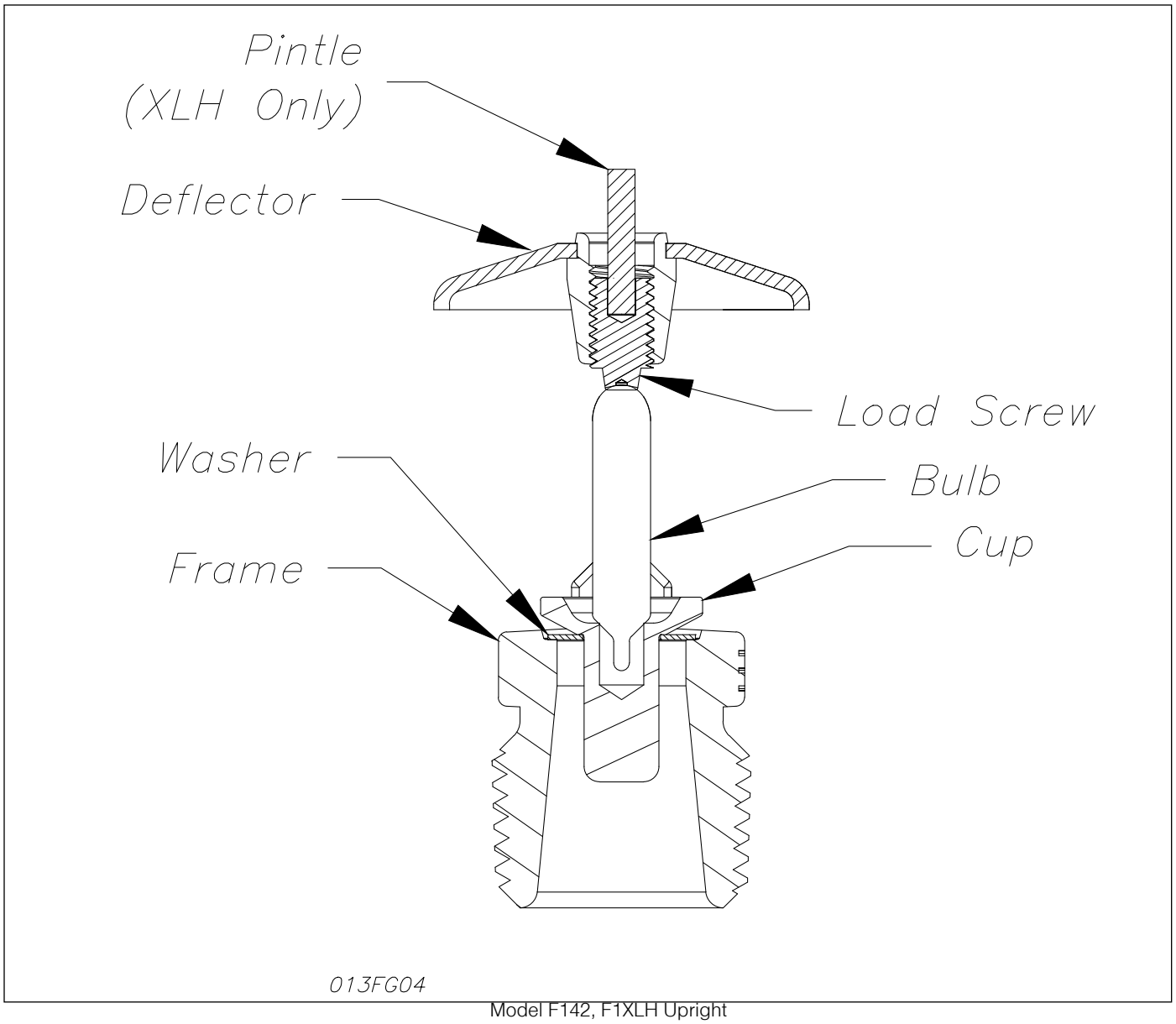

XLH Recessed Pendent FP

The F156, F142, F1XLH & F128 Series Automatic Sprinkler utilizes a 5.0 mm frangible glass bulb. The glass bulb consists of an accurately controlled amount of special fluid hermetically sealed inside a precisely manufactured glass capsule. This glass bulb is specially constructed to provide fast thermal response.

At normal temperatures, the glass bulb contains the fluid in both the liquid phase and in the vapor phase. The vapor phase can be seen as a small bubble. As heat is applied, the liquid expands forcing the bubble smaller and smaller as the liquid pressure increases. Continued heating forces the liquid to push out against the bulb, causing the glass to shatter, opening the waterway and allowing the deflector to distribute the discharging water.

The F156, F142, F1XLH & F128 Series Sprinkler temperature rating is identified by the color of the glass bulb capsule as well as frame color where applicable.

Reliable Automatic Sprinkler Co., Inc., 103 Fairview Park Drive, Elmsford, New York 10523



Model F142, F1XLH Upright

Technical data:

Models	Nominal K-Factor	Response	Thread Size	Max. Working Pressure	Min. Working Pressure	Temperature Rating	Finish
F156	5.6 (80 Metric)	Standard	½" NPT (R½)	250 PSI*	7 PSI	See "Temperature Ratings" Table	See "Finish Table"
F142 F1XLH	4.2 (60 Metric)			175 PSI			
F128	2.8 (40 Metric)						

Material Data:						
Frame	**Deflector**	**Load Screw**	**Pintle**	**Cup**	**Washer**	**Bulb**
DZR Brass QM Brass	CDA Alloy 260, CDA Alloy 220 or CDA Alloy 510	CDA Alloy 360 or CDA Alloy 544	CDA Alloy 360 or CDA Alloy 544	CDA Alloy 651 or CDA Alloy 693	Nickel Alloy 440 or Alloy 360 coated with PTFE Adhesive Tape	Glass

***Note:** Model F156 upright, pendent, and recessed pendent sprinklers (SIN RA1325 and RA1314) are cULus Listed for 250 psi (17 bar).

Model F156, Upright, Pendent & Conventional Sprinklers
Model F142, F1XLH & F128 Upright & Pendent Sprinklers

Installation Wrench: Model D Sprinkler Wrench or Model W2 Sprinkler Wrench

Installation Data:

Nominal Orifice	Thread Size	Nominal K-Factor		Sprinkler Height	Approval Organization	Sprinkler Identification Number (SIN)	
		US	Metric			Upright	Pendent
Standard-Upright (SSU) and pendent Deflectors Marked to Indicate Position							
½" (15mm) (1)	½" NPT (R½)	5.6	80	2.25" (57mm)	1, 2, 3, 4, 5	RA1325(2)(3)(5)(6)	RA1314(2)(3)(5)(6)
7/16" (10mm)	½" NPT (R½)	4.2	60	2.25" (57mm)	1	RA1323(2)(6)	RA1313(6)
3/8" (10mm)	½" NPT (R½)	2.8	40	2.25" (57mm)	1	RA1321(2)(6)	RA1311(6)
Conventional-Install in Upright or Pendent Position							
15mm (1)	½" NPT (R½)	5.6	80	57mm	3, 4, 5	RA1375(5)	

(1) Refer to Bulletin 024 for Special Response Sprinklers (F1S5-56)
(2) cULus Listed corrosion resistant (Polyester coated) sprinkler.
(3) Polyester coated FM Approved sprinkler.
(4) _____
(5) Polyester coated LPCB & VdS approved sprinkler RA1325, RA1314 & RA1375.
(6) Electroless Nickel PTFE Plated - UL listed Corrosion Resistant

Upright


Pendent


Conventional

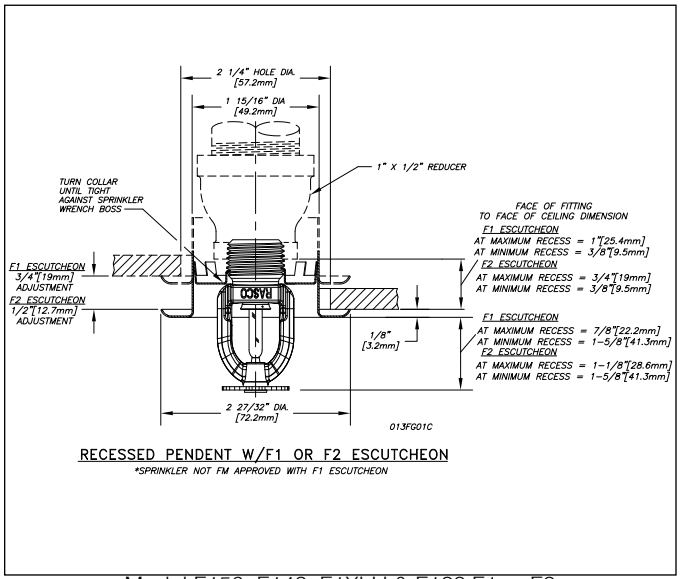
Model F156, F142, F1XLH & F128 Recessed Pendent Sprinklers(1)

Installation Wrench: Model GFR2 Sprinkler Wrench

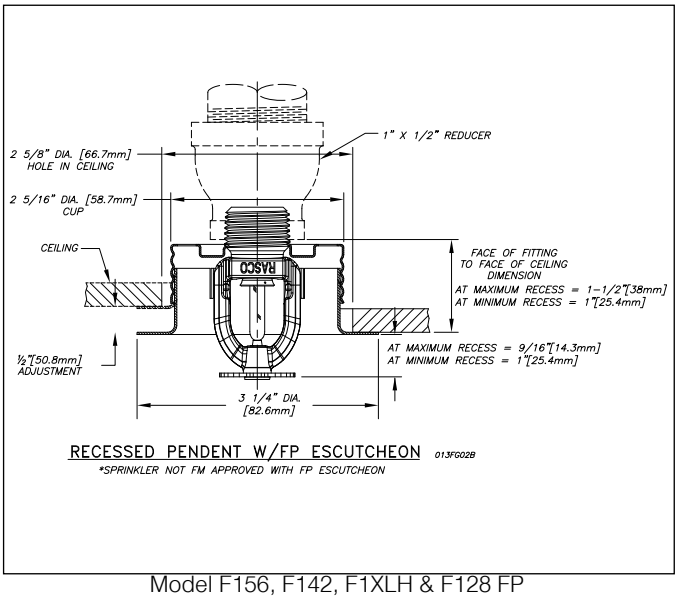
Installation Data:

Nominal Orifice	Thread Size	Nominal K-Factor		Sprinkler Height	Sprinkler Identification Number (SIN)
		US	Metric		
½" (15mm)	½" NPT (R½)	5.6	80	2.25" (57mm)	RA1314(2)
7/16" (10mm)	½" NPT (R½)	4.2	60	2.25" (57mm)	RA1313(2)
3/8" (10mm)	½" NPT (R½)	2.8	40	2.25" (57mm)	RA1311(2)

(1) Refer to escutcheon data table for approvals & dimensions
(2) Electroless Nickel PTFE Plated - cULus listed Corrosion Resistant



Model F156, F142, F1XLH & F128 F1 or F2



Model F156, F142, F1XLH & F128 FP

Model F156 Vertical Sidewall Sprinkler

Installation Wrench: Model W2 Sprinkler Wrench
Installation Position: Upright or Pendent
Approval Type: Light Hazard Occupancy

U.S. Patent No. 6,374,920

Sprinkler Type	Deflector to Ceiling Distance (Min. - Max.)
Upright	4" (102mm) - 12" (305mm)
Pendent	4" (102mm) - 12" (305mm)

Vertical Sidewall

Installation Data:

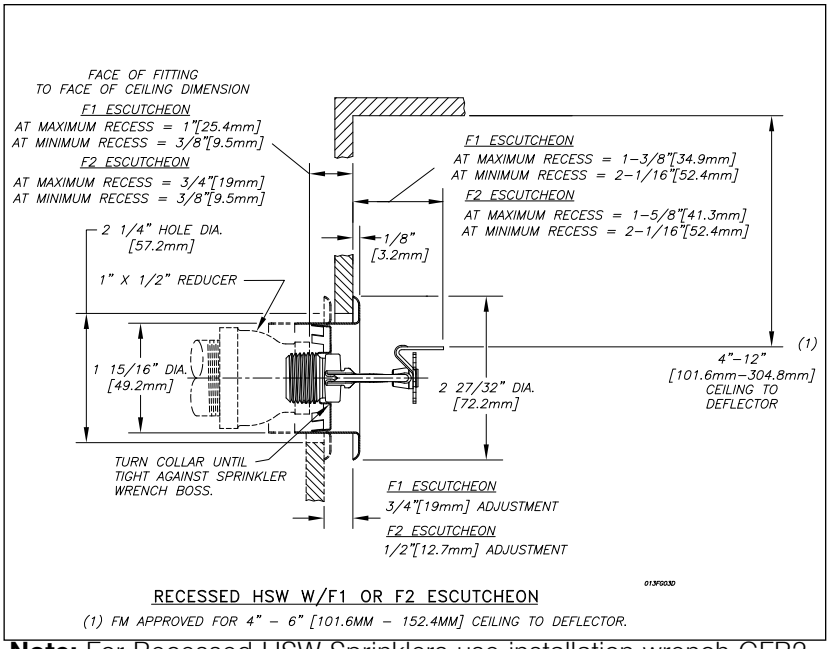
Nominal Orifice	Thread Size	Nominal K Factor		Sprinkler Height	Approval [1] Organizations	Sprinkler Identification Numbers (SIN)
		US	Metric			
½" (15mm)	½" NPT (R½)	5.6	80	2.25" (57mm)	1, 2, 3	RA1385[1][2][3][4]

[1] LPC Approval is pendent only, 57°C through 141°C ratings.
[2] cULus Listed corrosion resistant (Polyester coated) sprinkler.
[3] cULus Listed & FM Approved corrosion resistant for lead, wax and wax over lead.
[4] Electroless Nickel PTFE Plated - cULus listed Corrosion Resistant

Model F156 Horizontal Sidewall Sprinkler

Deflector: HSW
Installation Wrench: Model W2 Sprinkler Wrench


Horizontal Sidewall



Note: For Recessed HSW Sprinklers use installation wrench GFR2. FM and cULus permits use with F1 or F2 escutcheons for "Light Hazard" only.

Installation Data: Horizontal Sidewall

Nominal Orifice	Thread Size	Nominal K Factor		Sprinkler Height	Approval Organizations		Sprinkler Identification Numbers (SIN)
		US	Metric		Light Hazard	Ordinary Hazard	
½" (15mm)	½" NPT (R1/2)	5.6	80	2.63" (67mm)	1, 2	1	RA1335[1][2][3][4]

[1] cULus Listed corrosion resistant (Polyester coated) sprinkler.
[2] cULus Listed & FM Approved corrosion resistant for lead, wax and wax over lead.
[3] Polyester coated FM approved sprinkler.
[4] Electroless Nickel PTFE Plated - cULus listed Corrosion Resistant

Application

Model F156, F142, F1XLH, F128 & Model F156, F142, F1XLH & F128 Recessed sprinklers are used in fixed fire protection systems: Wet, Dry, Deluge or Preaction. Care must exercised that the orifice size, temperature rating, deflector style and sprinkler type are in accordance with the latest published standards of the National Fire Protection Association or the approving Authority Having Jurisdiction Installation.

Installation

Model F156, F142, F1XLH & F128 Series sprinklers are standard response sprinklers intended for installation as specified in NFPA 13. They must also be installed with the Model W2 Sprinkler Wrench specifically designed by Reliable for use with these sprinklers.

The Model F156, F142, F1XLH & F128 Recessed Sprinklers are to be installed with a maximum recess of ¾ inch (19mm). The Model F1, F2, and FP Escutcheon illustrated are the only recessed escutcheon to be used with the Model F156, F142, F1XLH & F128 Recessed Sprinklers. The use of any other recessed escutcheon will void all approvals and negate all warranties. When installing Model F156, F142, F1XLH & F128 Recessed Sprinklers use the Model GFR2 Sprinkler Wrench. Any other type of wrench may damage these sprinklers.

Note: A leak tight ½" NPT (R½) sprinkler joint can be obtained with a torque of 8 - 18 ft-lbs (11 - 24 N-m). Do not tighten sprinklers over maximum recommended torque. It may cause leakage or impairment of the sprinklers.

Glass bulb sprinklers have orange covers to protect the bulb during the installation process. REMOVE THIS PROTECTION ONLY AFTER THE SYSTEM HAS BEEN HYDROSTATICALLY TESTED AND, WHEN APPLICABLE, THE ESCUTCHEONS HAVE BEEN INSTALLED. RASCO wrenches are designed to install sprinklers when covers are in place.

Ordering Information

Specify:

1. Sprinkler Model
2. Sprinkler Type
3. Nominal K-Factor
4. Temperature Rating
5. Sprinkler Finish
6. Thread Type: [½" NPT] [ISO 7-1R½]
7. Escutcheon Finish (where applicable)

Note: When Models F156, F142, F1XLH & F128 Recessed Sprinklers are ordered, the sprinklers and escutcheons are packaged separately.

Escutcheon Data [1]

[1] SIN: RA1335 - cULus and FM permits use with F1 or F2 escutcheons for light hazard only.

Maintenance

The Model F156, F142, F1XLH & Model F156, F142, F1X-LH & F128 Recessed Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluid. Replace any sprinkler which has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

Temperature Ratings

Classification	Sprinkler Temperature		Max. Ambient Temp.	Bulb Color
	°C	°F		
Ordinary	57	135	100°F (38°C)	Orange
Ordinary	68	155	100°F (38°C)	Red
Intermediate	79	175	150°F (66°C)	Yellow
Intermediate	93	200	150°F (66°C)	Green
High[1]	141	286	225°F (107°C)	Blue
Extra High[1]	182	360	300°F (149°C)	Mauve
Ultra High [1] [2]	260	500	475°F (246°C)	Black

[1] Not available for recessed Sprinklers.
[2] cULus listed for SIN RA1325 and RA1314 only.

Maximum Working Pressure

175 psi (12 bar)
SIN RA1325 & RA1314 cULus listed for 250 psi (17 bar)
100% Factory tested hydrostatically to 500 psi (34.5 bar)

Finish[1]

Standard Finishes	
Sprinkler	**Escutcheon**
Bronze	Brass
Chrome	Chrome
Polyester Coated [6][7][9]	White Painted
Special Application Finishes	
Sprinkler	**Escutcheon**
Electroless Nickel PTFE[3][10]	Electroless Nickel PTFE
Bright Brass[2]	Bright Brass
Black Plated	Black Plated
Black Paint[3][9]	Black Paint
Off White[3][9]	Off White
Chrome Dull	Chrome Dull
Lead Plated[3][4][8]	
Wax Coated[3][4][5][8]	
Wax Over Lead[3][4][5][8]	

[1] Other colors and finishes are available on special order. Consult factory for details. Custom color painted sprinklers may not retain their UL Corrosion resistance listing.
[2] 200°F (93°C) maximum.
[3] UL and ULC listed only.
[4] 155°F to 200°F (68°C to 93°C) ratings only.
[5] 286°F (141°C) sprinklers may be coated for ambient conditions not exceeding 150°F (66°C).
[6] cULus listed "corrosion resistant" applies to SIN Number RA1325 (Upright) RA1323 (upright), RA1321(Upright), RA1335 (HSW), RA1385(VSW) and RA1314 (Pendent) in standard black or white. Corrosion resistance in other polyester colors is available upon request.
[7] FM Approved finish as "Polyester Coated" applies to SIN number RA1314, RA1335 & RA1325 in standard black or white.
[8] FM Approved finish applies only to SIN number RA1335 & RA1385.
[9] LPCB and VdS Approved finish applies only to RA1325, RA1314 and RA1375.
[10] cULus listed Corrosion Resistant applies to SIN RA1325 ,RA1314 ,RA1323, RA1313 ,RA1321, RA1311, RA1385 and RA1335

Reliable...For Complete Protection

Reliable offers a wide selection of sprinkler components. Following are some of the many precision-made Reliable products that guard life and property from fire around the clock.

- Automatic sprinklers
- Flush automatic sprinklers
- Recessed automatic sprinklers
- Concealed automatic sprinklers
- Adjustable automatic sprinklers
- Dry automatic sprinklers
- Intermediate level sprinklers
- Open sprinklers
- Spray nozzles
- Alarm valves
- Retarding chambers
- Dry pipe valves
- Accelerators for dry pipe valves
- Mechanical sprinkler alarms
- Electrical sprinkler alarm switches
- Water flow detectors
- Deluge valves
- Detector check valves
- Check valves
- Electrical system
- Sprinkler emergency cabinets
- Sprinkler wrenches
- Sprinkler escutcheons and guards
- Inspectors test connections
- Sight drains
- Ball drips and drum drips
- Control valve seals
- Air maintenance devices
- Air compressors
- Pressure gauges
- Identification signs
- Fire department connection

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable. Products manufactured and distributed by Reliable have been protecting life and property for over 90 years.

Manufactured by

Reliable®

Reliable Automatic Sprinkler Co., Inc.
(800) 431-1588 Sales Offices
(800) 848-6051 Sales Fax
(914) 829-2042 Corporate Offices
www.reliablesprinkler.com Internet Address

Recycled Paper

Revision lines indicate updated or new data.

EG. Printed in U.S.A. 11/19 P/N 9999970299

Reliable®

Model G5 Series Sprinklers

Standard Spray, Flat Concealed Pendent

Available with Gasketed Cover Plate

Features

- Standard Coverage, Concealed Pendent (K2.8, 4.2, 5.6, & 8.0 [40, 60, 80, & 115 metric])
- Flat concealed cover plate available in a variety of finishes.
- Available with Stainless Steel Clad cover plate (see Table I).
- 3/4-inch (19 mm) cover plate adjustment.
- Cover plate available with optional gasket.

Model G4/G5 Cover Plate

Model G4/G5 QR Gasket Cover Plate

Model G4/G5 SR Gasket Cover Plate

Model G4/G5 Series Sprinkler Cover Plates

Product Description

Model G5 series sprinklers are standard coverage, flat plate concealed sprinklers designed for installation in accordance with NFPA 13 and FM Global Property Loss Prevention Data Sheets. The sprinklers are offered with a standard Model G4/G5 cover plate, a Model G4/G5 cover plate with a Quick-response (QR) gasket, or a Model G4/G5 cover plate with a Standard-response (SR) gasket. Model G5 sprinklers with a gasketed cover plate are intended for use in dust free environments such as clean rooms. Model G5 sprinklers must only be used with the Model G4/G5 cover plate listed or approved with the sprinkler. All Model G5 series sprinklers use a fusible-link operating element. Table A provides a summary of available Model G5 series sprinklers, along with Listing and Approval in-formation for each sprinkler and cover plate combination.

Model G5 Series Sprinkler Summary — **Table A**

Sprinkler Model	K-Factor gpm/psi$^{1/2}$ (L/min/bar$^{1/2}$)	Cover Plate Model	Listings and Approvals	Sensitivity	Max. Working Pressure psi (bar)	Sprinkler Identification Number (SIN)
G5-28	2.8 (40)	G4/G5	cULus	QR	175 (12)	RA3411
			FM	SR		
		G4/G5 QR Gasket	cULus	QR		
		G4/G5 SR Gasket	cULus, FM	SR		
G5-42	4.2 (60)	G5	cULus	QR	175 (12)	RA3413
		G4/G5 QR Gasket				
		G4/G5 SR Gasket	cULus	SR		
G5-56	5.6 (80)	G5	cULus	QR	250 (17)	RA3415
			FM, LPCB, VdS, CE	SR	175 (12)	
		G4/G5 QR Gasket	cULus	QR	250 (17)	
		G4/G5 SR Gasket	cULus	SR	250 (17)	
			FM	SR	175 (12)	
G5-56 300	5.6 (80)	G5	cULus	QR	300 (21)	RA4014
		G4/G5 QR Gasket				
		G4/G5 SR Gasket	cULus	SR		
G5-80	8.0 (115)	G5	cULus	QR	175 (12)	RA3412
		G4/G5 QR Gasket				
		G4/G5 SR Gasket	cULus	SR		
G5-80F	8.0 (115)	G5	FM	SR	175 (12)	RA3417
		G4/G5 SR Gasket				

Model G5-28 Standard Coverage, Concealed Pendent Sprinkler — SIN RA3411

Technical Specifications
Style: Flat Concealed Pendent
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 2.8 (40 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Bronze Alloy
Cup: Steel

Sprinkler Temperature Ratings
165°F (74°C)
212°F (100°C)

Sensitivity
(See Table B)

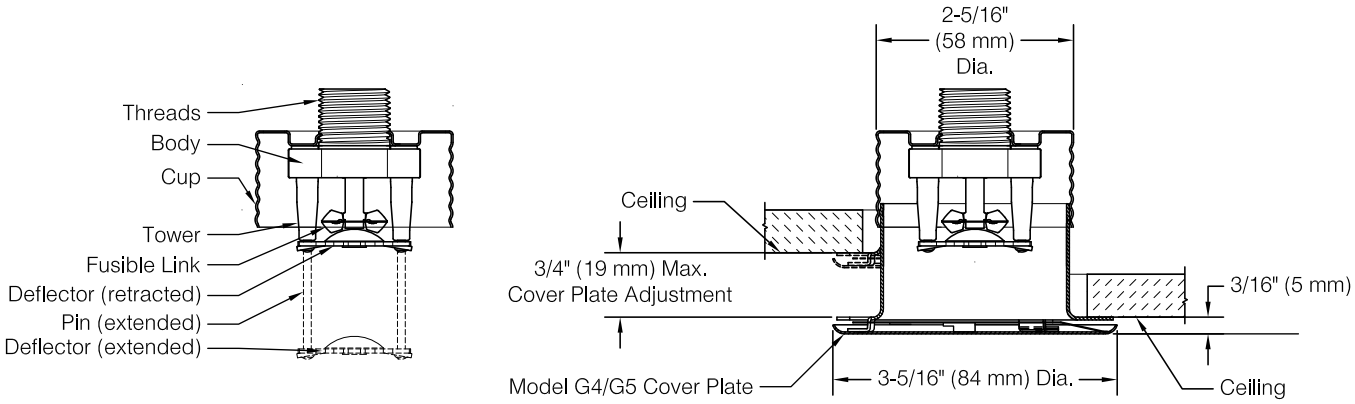
Cover Plates
Model G4/G5
Model G4/G5 QR Gasket (cULus only)
Model G4/G5 SR Gasket

Cover Plate Finishes
(See Table I)

Sprinkler Wrench
Model W3
Model FC

Listings and Approvals
cULus Listed (Light Hazard only)
FM Approved

Model G5-28 Sprinkler Components and Dimensions — Figure 1



Model G5-28 Sprinkler Sensitivity — Table B

Cover Plate Model	Listing or Approval Agency	
	cULus	FM
G4/G5	QR	SR
G4/G5 QR Gasket	QR	--
G4/G5 SR Gasket	SR	SR

QR: Quick-response
SR: Standard-response

Model G5-42 Standard Coverage, Concealed Pendent Sprinkler — SIN RA3413

Technical Specifications
Style: Flat Concealed Pendent
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 4.2 (60 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Bronze Alloy
Cup: Steel

Sprinkler Temperature Ratings
165°F (74°C)
212°F (100°C)

Sensitivity
(See Table C)

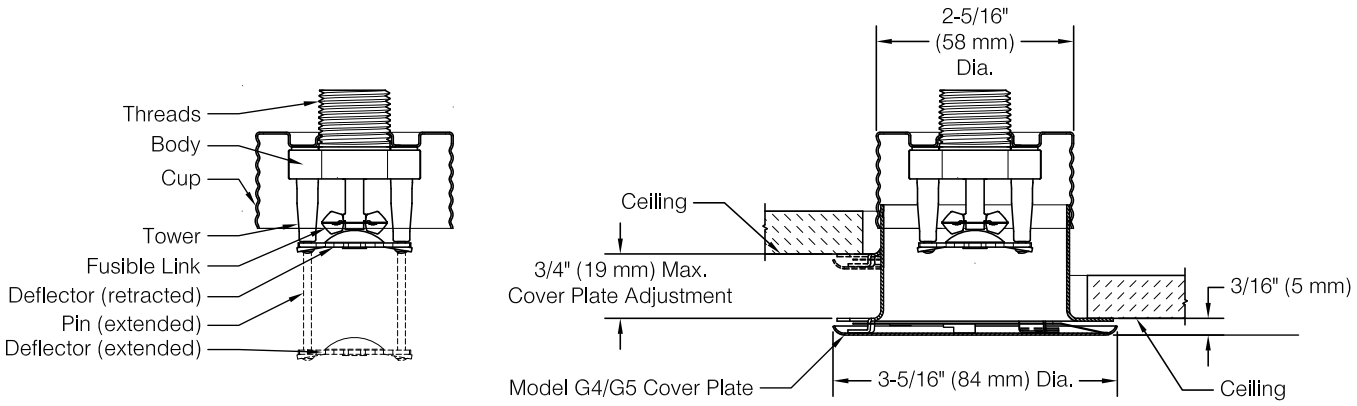
Cover Plates
Model G4/G5
Model G4/G5 QR Gasket
Model G4/G5 SR Gasket

Cover Plate Finishes
(See Table I)

Sprinkler Wrench
Model W3
Model FC

Listings and Approvals
cULus Listed (Light Hazard only)

Model G5-42 Sprinkler Components and Dimensions — Figure 2



Model G5-42 Sensitivity — Table C

Cover Plate Model	Listing or Approval Agency
	cULus
G4/G5	QR
G4/G5 QR Gasket	QR
G4/G5 SR Gasket	SR

QR: Quick-response
SR: Standard-response

Model G5-56 Standard Coverage, Concealed Pendent Sprinkler — SIN RA3415

Technical Specifications
Style: Flat Concealed Pendent
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
175 psi (12 bar)
250 psi (17 bar) (cULus only)

Material Specifications
Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Bronze Alloy
Cup: Steel

Sprinkler Temperature Ratings
165°F (74°C)
212°F (100°C) (cULus, FM, LPCB, CE only)

Sensitivity
(See Table D)

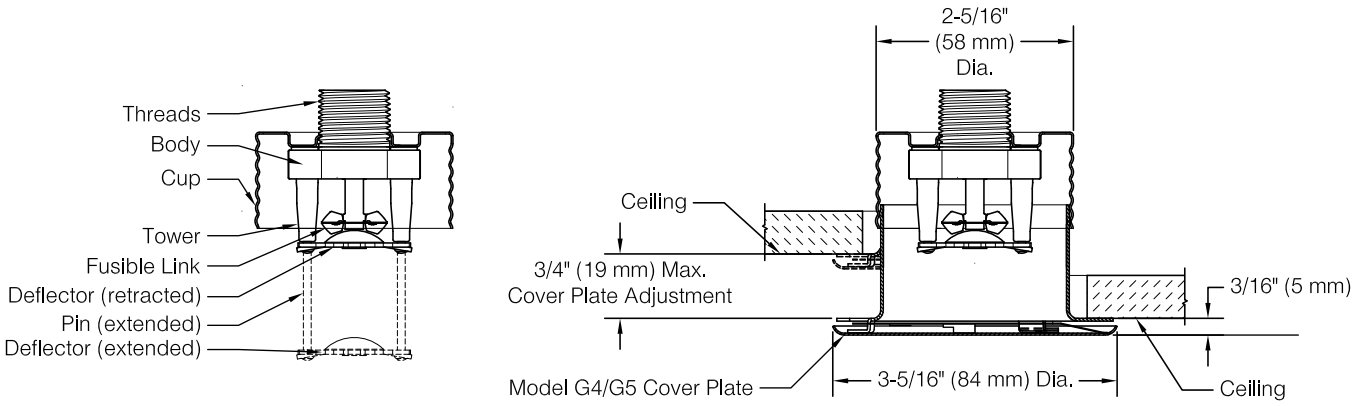
Cover Plates
Model G4/G5
Model G4/G5 QR Gasket (cULus only)
Model G4/G5 SR Gasket (cULus and FM only)

Cover Plate Finishes
(See Table I)

Sprinkler Wrench
Model W3
Model FC

Listings and Approvals
cULus Listed (Light & Ordinary Hazard only)
FM Approved
LPCB Approved
VdS Approved [165°F (74°C) only]
CE Listed

Model G5-56 Sprinkler Components and Dimensions — **Figure 3**



Model G5-56 Sensitivity — **Table D**

Cover Plate Model	Listing or Approval Agency		
	cULus	FM	LPCB, VdS, CE
G4/G5	QR	SR	SR
G4/G5 QR Gasket	QR	--	--
G4/G5 SR Gasket	SR	SR	--

QR: Quick-response
SR: Standard-response

Model G5-56 300 Standard Coverage, Concealed Pendent Sprinkler — SIN RA4014

Technical Specifications
Style: Flat Concealed Pendent
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 300 psi (21 bar)

Material Specifications
Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Bronze Alloy
Cup: Steel

Sprinkler Temperature Ratings
165°F (74°C)
212°F (100°C)

Sensitivity
(See Table E)

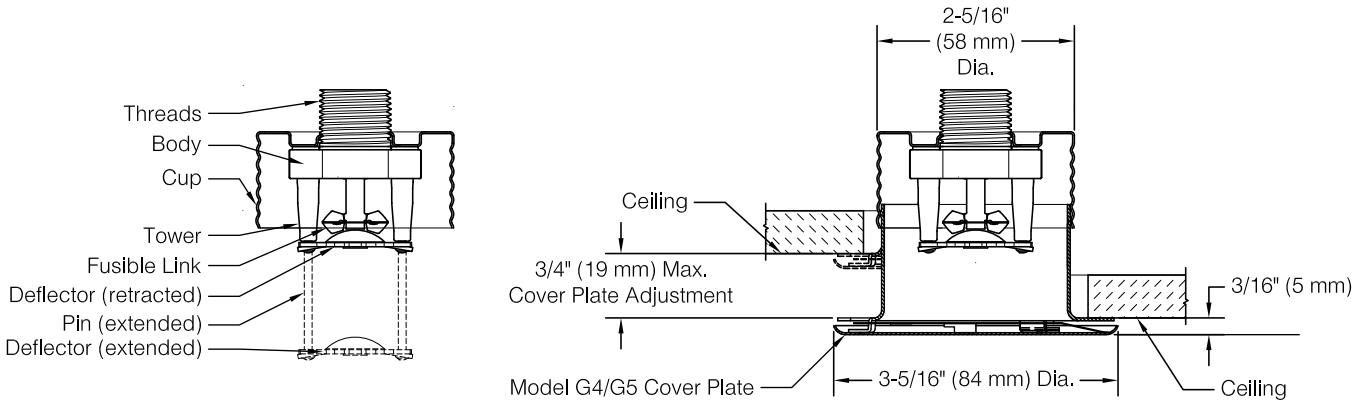
Cover Plates
Model G4/G5
Model G4/G5 QR Gasket
Model G4/G5 SR Gasket

Cover Plate Finishes
(See Table I)

Sprinkler Wrench
Model W3
Model FC

Listings and Approvals
cULus Listed (Light & Ordinary Hazard only)

Model G5-56 300 Sprinkler Components and Dimensions — **Figure 4**



Model G5-56 300 Sensitivity — **Table E**

Cover Plate Model	Listing or Approval Agency
	cULus
G4/G5	QR
G4/G5 QR Gasket	QR
G4/G5 SR Gasket	SR

QR: Quick-response
SR: Standard-response

Model G5-80 Standard Coverage, Concealed Pendent Sprinkler — SIN RA3412

Technical Specifications
Style: Flat Concealed Pendent
Threads: 3/4" NPT or ISO 7-1 R3/4
Nominal K-Factor: 8.0 (115 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Bronze Alloy
Cup: Steel

Sprinkler Temperature Ratings
165°F (74°C)
212°F (100°C)

Sensitivity
(See Table F)

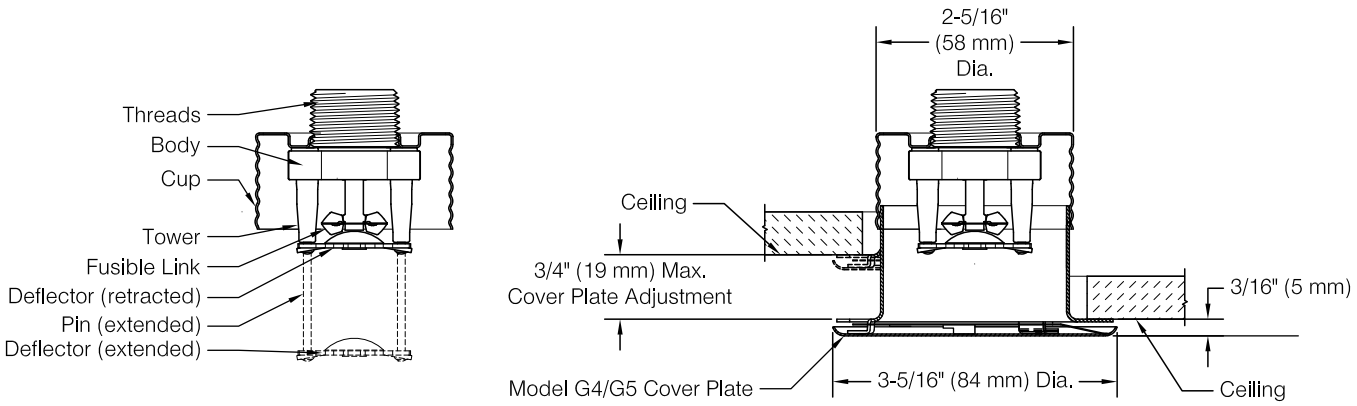
Cover Plates
Model G4/G5
Model G4/G5 QR Gasket
Model G4/G5 SR Gasket

Cover Plate Finishes
(See Table I)

Sprinkler Wrench
Model W3
Model FC

Listings and Approvals
cULus Listed (Light & Ordinary Hazard only)

Model G5-80 Sprinkler Components and Dimensions — Figure 5



Model G5-80 Sensitivity — Table F

Cover Plate Model	Listing or Approval Agency
	cULus
G4/G5	QR
G4/G5 QR Gasket	QR
G4/G5 SR Gasket	SR

QR: Quick-response
SR: Standard-response

Model G5-80F Standard Coverage, Concealed Pendent Sprinkler — SIN RA3417

Technical Specifications
Style: Flat Concealed Pendent
Threads: 3/4" NPT or ISO 7-1 R3/4
Nominal K-Factor: 8.0 (115 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Fusible Link: Beryllium Nickel
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing washer: Nickel with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Stainless Steel
Cup: Steel

Sprinkler Temperature Ratings
165°F (74°C)
212°F (100°C)

Sensitivity
Standard Response

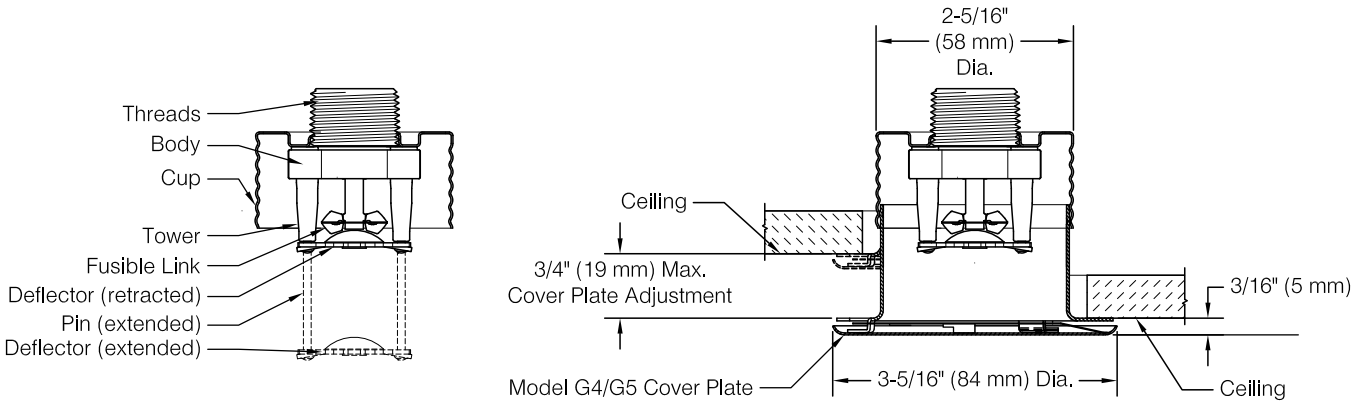
Cover Plates
Model G4/G5
Model G4/G5 SR Gasket

Cover Plate Finishes
(See Table I)

Sprinkler Wrench
Model W3
Model FC

Listings and Approvals
FM Approved

Model G5-80F Sprinkler Components and Dimensions — **Figure 6**



Model G5-80F Sensitivity — **Table G**

Cover Plate Model	Listing or Approval Agency
	FM
G4/G5	SR
G4/G5SR Gasket	SR

SR: Standard-response

Installation Dimensions and Cover Plate Information — **Table H**

Cover Plate Model	Cover Plate Diameter Inch (mm)	Recommended Hole Diameter in Ceiling Inch (mm)	Cover Plate Adjustment Inch (mm)	Min. to Max. Face of Fitting to Ceiling[1] Inch (mm)	Min. to Max. Dropped Deflector Distance below Ceiling Inch (mm)	Cover Plate Temperature Rating °F (°C)
G4/G5	3-5/16 (84)	2-5/8 (67)	3/4 (19)	1-1/2 to 2-1/4 (38 to 57)	1/4 to 1 (6 to 25)	135°F[3] (57°C) or 165°F[4] (74°C)
G4/G5 QR Gasket[2]	3-11/16 (94)					
G4/G5 SR Gasket[2]	4 (101 mm)					

Notes:

1. Face of fitting to ceiling dimensions are based on nominal thread make up. Verify dimensions based on fitting and thread sealing method prior to installation. A 1/2" x 1/2" brass nipple extension (Reliable P/N 6999991900) is available to assist with replacement of Reliable Model G4A sprinklers.
2. Model G4/G5 QR Gasket and Model G4/G5 SR Gasket cover plates are sold as assembled units including both the cover plate and gasket. Model G4/G5 QR Gasket and Model G4/G5 SR Gasket cover plates and gaskets are not interchangeable.
3. For use with 165°F (74°C) temperature rated sprinklers where the Maximum Ceiling Temperature does not exceed 100°F (38°C).
4. For use with 212°F (100°C) temperature rated sprinklers where the Maximum Ceiling Temperature does not exceed 150°F (66°C).

Cover Plate Finishes[1] — **Table I**

Standard Finishes	Special Application Finishes
White Paint	Off-White Paint
Chrome	Black Paint
	Custom Color Paint – Specify[2]
	Raw Brass (Lacquered)
	Bright Brass
	Finished Bronze
	Black Plated
	Satin Chrome
	Stainless Steel Clad[3]

Notes:

1. Paint or any other coating applied over the factory finish will void all approvals and warranties. Gaskets for Model G5 QR Gasket and Model G4/G5 SR Gasket cover plates are only available in white.
2. Custom color paint is semi-gloss unless specified otherwise.
3. Stainless steel clad cover plates are Type 316 Stainless Steel on the finished side and C102 Copper Alloy on the back side. Cover plates are not listed or approved as corrosion resistant.

Application

Model G5 series sprinklers are standard coverage, flat plate concealed pendent sprinklers. The sprinklers are intended for use in accordance with NFPA 13 and FM Global Property Loss Prevention Data Sheets, as well as the requirements of the applicable approval agencies.

Model G5 series sprinklers are available as either Quick-response (QR) or Standard-response (SR) depending on the approval agency and cover plate selected.

Model G5 series sprinklers use Model G4/G5 flat cover plates. Model G4/G5 QR Gasket and G4/G5 SR Gasket cover plates are available to limit air and dust movement through the ceiling.

Listing & Approval Agencies

Individual Model G5 series sprinkler may be listed or approved by the following agencies:

- Underwriters Laboratories, Inc. and UL Canada (cULus)
  Listing Category: Sprinklers, Automatic and Open
  Guide Number: VNIV
- FM Approvals (FM)
- Loss Prevention Certification Board (LPCB)
- VdS Schadenverhütung GmbH (VdS)
- EC-Certificate of Conformity 0832-CPD-2062 (CE)

See Table A and the individual sprinkler data sheets in this Bulletin for listings and approvals applicable to each sprinkler.

Installation

Model G5 series sprinklers are intended to be installed in accordance with NFPA 13, FM Global Property Loss Prevention Data Sheets, and the requirements of applicable authorities having jurisdiction. Model G5 series sprinklers must not be installed in ceilings with positive pressure in the space above. Ensure that the 4 slots in the cup are open and unobstructed following installation.

Model G5 series sprinklers are shipped with a wrench-able protective cap that should remain on the sprinkler until the sprinkler system is placed in service following construction.

Model G5 series sprinklers can be installed without removing the wrench-able protective cap using the Model W3 wrench. Alternatively, Model G5 series sprinklers can be installed using the Model FC wrench by temporarily removing the protective cap during installation of the sprinkler. The use of any other wrench to installed Model G5 series sprinklers is not permitted and may damage the sprinkler.

Wrench

Model FC
For use with Model G5 Series sprinklers without wrench-able cap installed

Model W3
For use with Model G5 Series sprinklers with wrench-able cap installed

Fully insert the Model W3 wrench over the cap until it reaches the bottom of the cup, or the Model FC wrench over the sprinkler until the wrench engages the body. Do not wrench any other part of the sprinkler/cup assembly. The Model W3 and FC wrenches are designed to be turned with a standard 1/2" square drive. Tighten the sprinkler into the fitting after applying a PTFE based thread sealant to the sprinkler's threads. Recommended installation torque is specified in Table J.

Installation Torque — **Table J**

Sprinkler Threads	Recommended Installation Torque (min. – max.)	
	ft.lb	N.m
½" NPT or ISO7-1R1/2	8-18	11-24
¾" NPT or ISO7-1R3/4	14-20	19-27

Do not exceed the maximum recommended torque. Exceeding the maximum recommended torque may cause leakage or impairment of the sprinkler. Use care when inserting or removing the wrench from the sprinkler to avoid damage to the sprinkler.

Install the cover plate by hand, pushing and then turning the cover in the clockwise direction until it is tight against the ceiling. For Model G4/G5 QR Gasket and Model G4/G5 SR Gasket cover plates, the gasket should be attached to the flange of the cover plate skirt only. Do not glue the gasket in place or allow the gasket to overlap both the cover plate and the flange of the skirt.

Maintenance

Reliable Model G5 series sprinkler should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler or cover plate which has been painted (other than factory applied). Properly installed Model G5 cover plates will have an air gap that is required for proper operation, do not seal the gap or paint the cover plates. Model G5 series sprinklers have holes in the cup that must remain unobstructed.

Replace any sprinkler which has been damaged. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Patents

Model G5 series sprinklers may be covered by one or more of the following patents:

U.S. Patent 6,554,077, U.S. Patent 7,275,603, U.S. Patent 8,776,903, U.S. Patent 9,248,327

Ordering Information

Specify the following when ordering.

Sprinkler
- Model [G5-28] [G5-42] [G5-56] [G5-56 300] [G5-80] [G5-80F]
- Temperature Rating [165°F (74°C)] [212°F (100°C)]
- Threads [NPT or ISO 7-1]

Cover Plate
- Model [G4/G5, G4/G5 QR Gasket, G4/G5 SR Gasket]
- Finish (See Table I)

Sprinkler Wrench
- Model W3
- Model FC

P/N 9999970421

Reliable®

Model F1-SS Series Stainless Steel Sprinklers

Standard spray, standard-response

cULus Listed, FM Approved

Features

- Type 316 stainless steel alloy frame, deflector, and cap
- cULus Listed and FM Approved as Corrosion Resistant sprinklers
- Available as Upright, Pendent, or Recessed Pendent sprinklers
- Available with polyester finishes

Product Description

Model F1-SS series sprinklers are standard spray, standard-response sprinklers intended for installation in accordance with NFPA 13. The sprinklers are cULus Listed and FM Approved as Corrosion Resistant sprinklers and feature a frame, deflector, and cap made of Type 316 stainless steel alloy.

Model F1-SS series sprinklers include upright and pendent sprinklers. Model F1-SS series pendent sprinklers are cULus Listed for installation with Reliable Model F1 and FP recessed escutcheons. The Reliable Model F2 escutcheon is cULus Listed and FM Approved for use with Model F1-SS series sprinklers. Reliable Model B one-piece escutcheons are also available. All escutcheons listed in this bulletin are manufactured Type 316 stainless steel alloy.

All Model F1-SS series sprinklers use a 5 mm glass bulb operating element and beryllium-nickel alloy sealing washer gold plated per MIL-G-45204, Type 3, Class 2 with PTFE tape on both sides.

F1-56SS Upright

F1-80SS Upright

F1-56SS Pendent

F1-80SS Pendent

Model F1
Recessed Escutcheon

Model F2
Recessed Escutcheon

Model FP
Recessed Escutcheon

Model B
Escutcheon

Table A

Sprinkler Model	Nominal K-Factor gpm/psi$^{1/2}$ (l/min/bar$^{1/2}$)	Thread Size NPT or ISO7-1	Sprinkler Identification Number (SIN)
F1-56SS Pendent	5.6 (80)	1/2	RA6414
F1-56SS Upright	5.6 (80)	1/2	RA6424
F1-80SS Pendent	8.0 (115)	3/4	RA6412
F1-80SS Upright	8.0 (115)	3/4	RA6422

Model F1-56SS Pendent Standard Spray Sprinkler — SIN RA6414

Technical Specifications
Style: Pendent or Recessed Pendent
Threads: 1/2" NPT or ISO 7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Thermal Sensor: 5 mm glass bulb
Frame: Type 316L stainless steel
Sealing Washer: Beryllium-nickel alloy gold plated per MIL-G-45204, Type 3, Class 2 w/ PTFE tape on both sides.
Load Screw: Type 316 stainless steel
Deflector: Type 316 stainless steel
Cap: Type 316 stainless steel

Recessed Escutcheons
F1 (cULus Listed)
F2 (cULus Listed, FM Approved)
FP (cULus Listed)

Guards and Shields [1]
D-1 Guard (cULus)
D-5 Guard & Shield (cULus)
S-1 Shield (cULus)
C-1 Guard (FM)
C-5 Guard & Shield (FM)
D-1 Guard (FM)
D-4 Guard & Shield (FM)
D-5 Guard & Shield (FM)
S-1 Shield (FM)

Finishes
None
White Polyester[2]
Black Polyester [2]
Custom Color Polyester [2]

Sensitivity
Standard-response

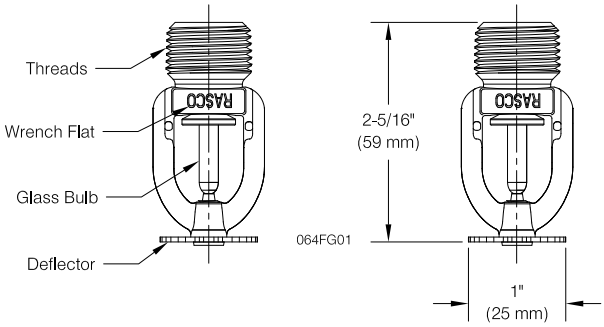
Temperature Rating
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C) (pendent only, non-recessed)
360°F (182°C) (pendent only, non-recessed)
500°F (260°C) (cULus only, pendent only, non-recessed)

Sprinkler Wrench
Model W2 (pendent)
Model GFR2 (recessed pendent)

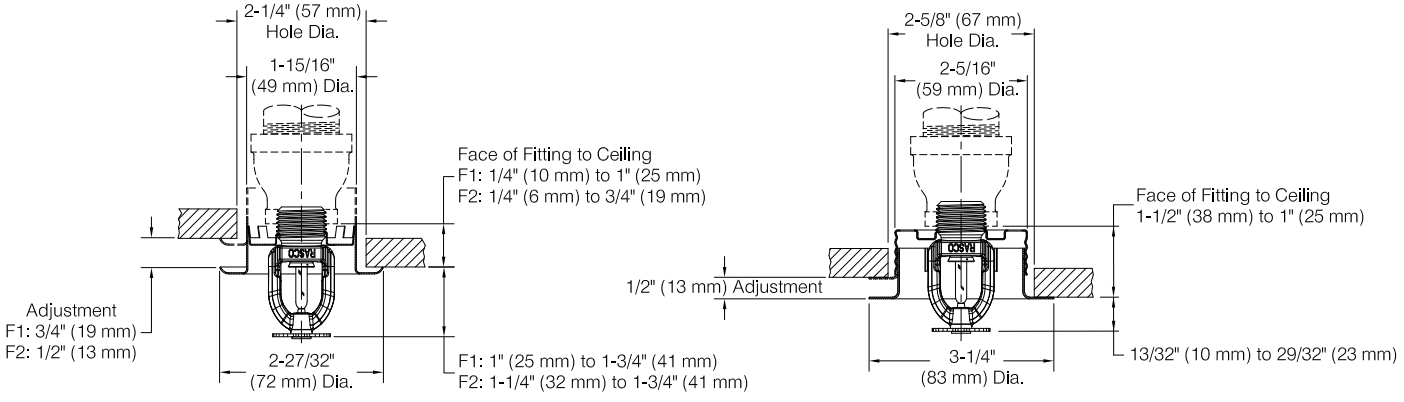
Listings and Approvals
cULus Listed
FM Approved

Notes:
[1] Guards and shields are formed from steel and are not considered corrosion resistant.
[2] Not available with 500°F (260°C) temperature rating.

Model F1-56SS Pendent Sprinkler Components and Dimensions — Figure 1



Model F1-56SS Recessed Pendent Sprinkler Installation and Dimensions — Figure 2



Model F1-56SS Pendent Sprinkler with Model F1 or F2 Recessed Escutcheon — 064FG02 — Model F1-56SS Pendent Sprinkler with Model FP Recessed Escutcheon

Model F1-56SS Upright Standard Spray Sprinkler — SIN RA6424

Technical Specifications
Style: Upright
Threads: 1/2" NPT or ISO 7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Thermal Sensor: 5 mm glass bulb
Frame: Type 316L stainless steel
Sealing Washer: Beryllium-nickel alloy gold plated per MIL-G-45204, Type 3, Class 2 w/ PTFE tape on both sides.
Load Screw: Type 316 stainless steel
Deflector: Type 316 stainless steel
Cap: Type 316 stainless steel

Sprinkler Wrench
Model W2

Guards and Shields [1]
D-1 Guard (cULus)
C-3 Guard & Shield (cULus, FM)
D-3 Guard & Shield (cULus)
C-1 Guard (FM)

Finishes
None
White Polyester [2]
Black Polyester [2]
Custom Color Polyester [2]

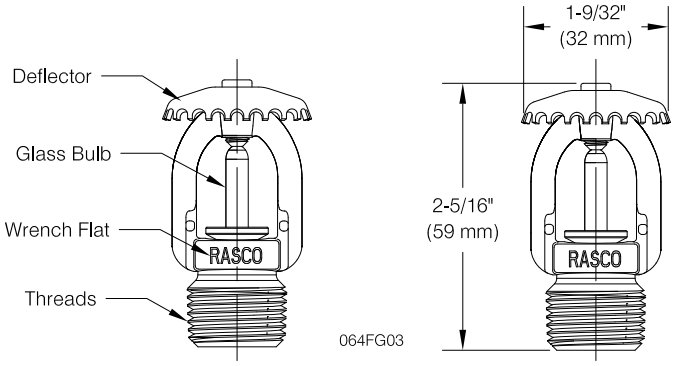
Sensitivity
Standard-response

Temperature Rating
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)
360°F (182°C)
500°F (260°C) (cULus only)

Listings and Approvals
cULus Listed
FM Approved

Notes:
[1] Guards and shields are formed from steel and are not considered corrosion resistant.
[2] Not available with 500°F (260°C) temperature rating.

Model F1-56SS Upright Sprinkler Components and Dimensions — Figure 3



Model F1-80SS Pendent Standard Spray Sprinkler — SIN RA6412

Technical Specifications
Style: Pendent or Recessed Pendent
Threads: 3/4" NPT or ISO 7-1R3/4
Nominal K-Factor: 8.0 (115 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Thermal Sensor: 5 mm glass bulb
Frame: Type 316L stainless steel
Sealing Washer: Beryllium-nickel alloy gold plated per MIL-G-45204, Type 3, Class 2 w/ PTFE tape on both sides.
Load Screw: Type 316 stainless steel
Deflector: Type 316 stainless steel
Cap: Type 316 stainless steel

Recessed Escutcheons
F1 (cULus Listed)
F2 (cULus Listed, FM Approved)
FP (cULus Listed)

Guards and Shields*
D-1 Guard (cULus)
D-5 Guard & Shield (cULus)
S-2 Shield (cULus, FM)
C-1 Guard (FM)
C-5 Guard & Shield (FM)

Finishes
None
White Polyester
Black Polyester
Custom Color Polyester

Sensitivity
Standard-response

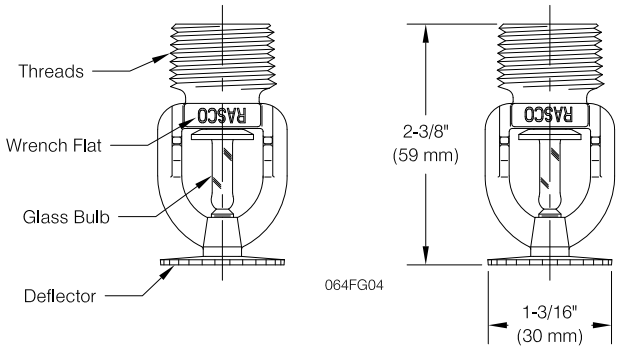
Temperature Rating
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C) (pendent only, non-recessed)
360°F (182°C) (pendent only, non-recessed)

Sprinkler Wrench
Model W2 (pendent)
Model GFR2 (recessed pendent)

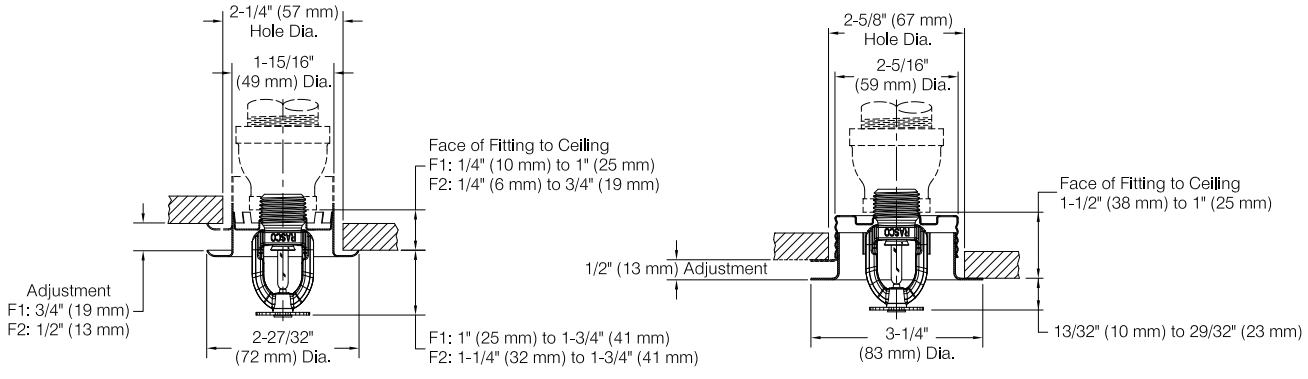
Listings and Approvals
cULus Listed
FM Approved

***Note:** Guards and shields are formed from steel and are not considered corrosion resistant.

Model F1-80SS Pendent Sprinkler Components and Dimensions — Figure 4



Model F1-80SS Recessed Pendent Sprinkler Installation and Dimensions — Figure 5



Model F1-80SS Upright Standard Spray Sprinkler — SIN RA6422

Technical Specifications
Style: Upright
Threads: 3/4" NPT or ISO 7-1R3/4
Nominal K-Factor: 8.0 (115 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Thermal Sensor: 5 mm glass bulb
Frame: Type 316L stainless steel
Sealing Washer: Beryllium-nickel alloy gold plated per MIL-G-45204, Type 3, Class 2 w/ PTFE tape on both sides.
Load Screw: Type 316 stainless steel
Deflector: Type 316 stainless steel
Cap: Type 316 stainless steel

Sprinkler Wrench
Model W2

Guards and Shields*
D-1 Guard (cULus)
C-3 Guard & Shield (cULus)
D-3 Guard & Shield (cULus)

Finishes
None
White Polyester
Black Polyester
Custom Color Polyester

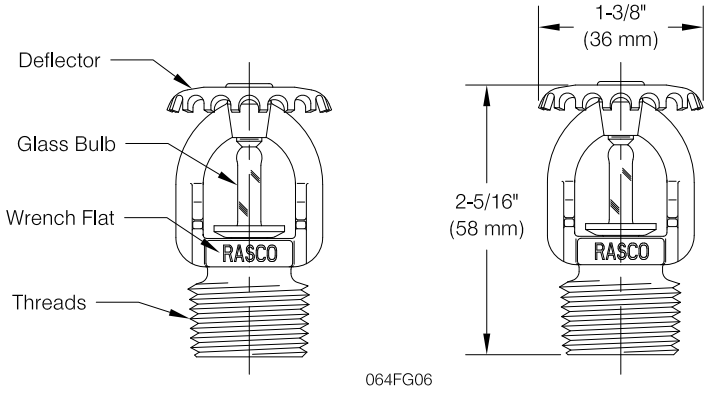
Sensitivity
Standard-response

Temperature Rating
135°F (57°C)
155°F (68°C)
175°F (79°C)
200°F (93°C)
286°F (141°C)
360°F (182°C)

Listings and Approvals
cULus Listed
FM Approved

***Note:** Guards and shields are formed from steel and are not considered corrosion resistant.

Model F1-80SS Upright Sprinkler Components and Dimensions — **Figure 6**



Wrench

Model W2 (upright, pendent)

(original)

(updated)

Model GFR2 (recessed pendent)

Application

Model F1-SS series sprinklers are standard spray, standard-response sprinklers intended for installation in accordance with NFPA 13 and the requirements of applicable Authorities Having Jurisdiction. Model F1-SS series sprinklers are cULus Listed and FM Approved as Corrosion Resistant sprinklers. Verify compatibility with the environment where the sprinkler will be located prior to installation.

Installation

Glass bulb sprinklers have orange bulb protectors to minimize bulb damage during shipping, handling, and installation. Reliable sprinkler installation wrenches are designed to install sprinklers with bulb protectors in place. Remove the bulb protector at the time when the sprinkler system is placed in service for fire protection. Removal of the bulb protector before this time may leave the bulb vulnerable to damage. Remove bulb protectors by undoing the clasp by hand. Do not use tools to remove bulb protectors.

Model F1-SS series sprinklers must be installed with the Reliable sprinkler installation wrench identified in this Bulletin. Any other wrench may damage the sprinkler. Recommended installation torque is 8 to 18 lb/ft (11 to 24 N/m) for 1/2" NPT and ISO7-1R1/2 sprinklers or 14 to 20 lb/ft (19 to 27 N/m) for 3/4" NPT and ISO7-1R3/4 sprinklers. Do not tighten sprinklers over the maximum recommended installation torque. Exceeding the maximum recommended installation torque may cause leakage or impairment of the sprinkler.

Recessed pendent sprinklers are to be installed as shown in Fig. 2 or Fig 5., as applicable to the specific model being installed. Model F1-SS series recessed pendent sprinklers may only be installed with the Reliable Model F1 stainless steel, Model F2 Stainless Steel, or Model FP stainless steel recessed escutcheon. The use of any other recessed escutcheon will void all approvals and negate all warranties. The Reliable Model FP escutcheon may not be used in ceilings having positive pressure with respect to the space below. Ensure that the openings in the Model FP escutcheon/can assembly are unobstructed following installation.

Finishes **Table B**

Sprinkler Finishes	Escutcheon Finishes
None White Polyester Black Polyester Custom Color Polyester	None White Polyester Chrome Plated Brass Plated

Maintenance

Model F1-SS series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Remove dust by gentle vacuuming. Replace any sprinkler which has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

Listings and Approvals

- Listed by Underwriters Laboratories, Inc. and UL Certified for Canada (cULus) - Guide Number VNIV.EX454 - Sprinklers, Automatic and Open
- FM Approved

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Sprinkler
- Model: F1-56SS Pendent, F1-56SS Upright, F1-80SS Pendent, F1-80SS Upright
- Temperature Rating: 135°F (57°C), 155°F (68°C), 175°F (79°C), 200°F (93°C), 286°F (141°C), 360°F (182°C), 500°F (260°C)
- Threads: NPT or ISO7-1
- Finish: None, White Polyester, Black Polyester Custom Color Polyester

Escutcheon (Pendent Only)
- Model: F1 recessed stainless steel, F2 recessed stainless steel, FP recessed stainless steel, B stain less steel

Sprinkler Wrench
- Model W2 (pendent, upright)
- Model GFR2 (recessed pendent)

P/N 999970521

Reliable®

Model F156-300 Series 300 psi (20,7 bar) Rated Standard Response Standard Spray

Bulletin 025 Rev. D

Model F156-300

Sprinkler Types

- Upright
- Pendent
- Recessed Pendent F1/F2/FP

Listing & Approval

1. Listed by Underwriters Laboratories, Inc. and Certified for Canada (cULus)

UL Listing Category

Sprinklers, Automatic & Open (VNIV)

Product Description

Reliable Models F156-300 Upright, Pendent and Recessed Pendent Sprinklers are high pressure rated automatic sprinklers which can handle a maximum service pressure of 300 psi (20,7 bar).

The Model F156-300 glass bulb sprinkler combines durability with the attractive low profile of a decorative sprinkler. Whether installed on exposed piping or below an office ceiling, it is functional and attractive.

The Model F1 Series Recessed Escutcheon provides convenient adjustment for Model F156-300 Sprinklers. The two-piece construction makes field installation an easy and rapid task. This also allows ceiling panels to later be removed without shutting down the fire protection system, thus facilitating maintenance of above ceiling services.

The Models F156-300 Upright, Pendent and Recessed Pendent automatic sprinklers are standard response sprinklers which utilize a 5.0mm frangible glass bulb. The glass bulb contains an accurately controlled amount of special fluid hermetically sealed inside. The other sprinkler parts are made of brass, copper or beryllium nickel.

At normal temperatures, the glass bulb contains fluid in both the liquid and vapor phases. The vapor phase can be seen as a small bubble. As heat is applied, the liquid expands, forcing the bubble smaller and smaller as the liquid pressure increases. Continued heating forces the liquid to push out against the bulb, causing the glass to shatter, opening the waterway and allowing the deflector to distribute the discharging water.

Upright

Pendent

Recessed Pendent/F1/F2

Recessed Pendent/FP

The temperature rating of the sprinkler is identified by the color of the glass bulb.

Application

The most common applications for Model F156-300 sprinklers will be in fire protection systems for high rise buildings or where the pressure entering the sprinkler system is in excess of 175 psi (12 bar). The use of these sprinklers will provide opportunity to reduce or eliminate the need for pressure reducing valves.

Reliable Automatic Sprinkler Co., Inc., 103 Fairview Park Drive, Elmsford, New York 10523

Model F156-300 Upright & Pendent Sprinklers

Installation Wrench: Model W2 Sprinkler Wrench

Installation Data:

Sprinkler Height	Nominal Orifice Size	Thread Size	Nominal K Factor		Sprinkler Height	Sprinkler Identification Number (SIN)
			US	Metric		
Upright	½" (15mm)	½" NPT(R½)	5.6	80	2.25" (57mm)	RA2525[1]
Pendent	½" (15mm)	½" NPT(R½)	5.6	80	2.25" (57mm)	RA2514[1]

[1] cULus Listed corrosion resistant (Polyester coated) sprinklers.

Upright

Pendent

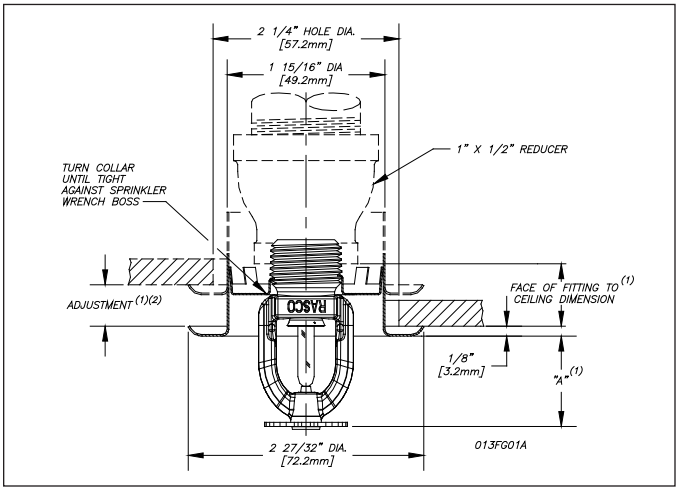
Model F156-300 Recessed Pendent Sprinkler

Installation Wrench: Model GFR2 Sprinkler Wrench

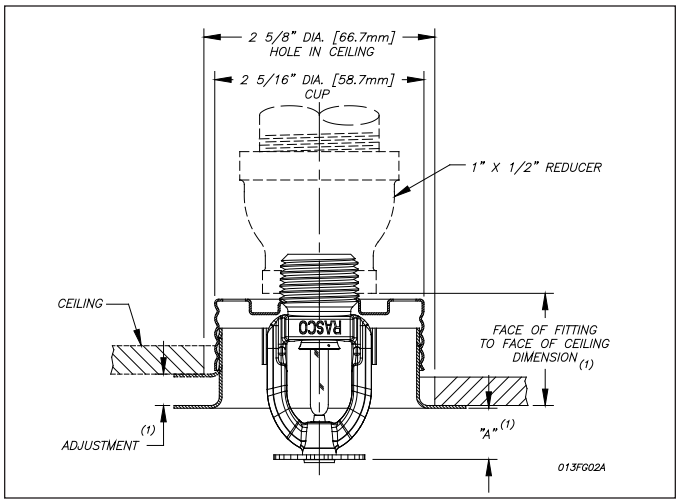
Installation Data:

Sprinkler Type	Nominal Orifice Size	Thread Size	Nominal K Factor		Sprinkler Height	Sprinkler Identification Number (SIN)
			US	Metric		
Recessed Pendent	½" (15mm)	½" NPT(R½)	5.6	80	2.25" (57mm)	RA2514

[1] Refer to escutcheon data table for dimensions.
[2] When installed directly into a tee, the escutcheon adjustment will be reduced.



Model F156-300 F1/F2
Fig. 1



Model F156-300 FP
Fig. 2

Installation

Model F156-300 Sprinklers are standard response sprinklers intended for installation as specified in NFPA

13. They must be installed with the Model W2 Sprinkler Wrench specifically designed by Reliable for use with these sprinklers.

Model F156-300 Recessed Pendent Sprinklers are to be installed with a maximum recess of ¾" (19mm). The Model F1, F2, and FP Escutcheons illustrated are the only recessed escutcheons to be used with Model F156-300 Pendent Sprinklers. The use of any other recessed escutcheon will void all approvals and negate all warranties.

When installing Model F156-300 Recessed Pendent Sprinklers, use the Model GFR2 Sprinkler Wrench. Any other type of wrench may damage these sprinklers.

Glass bulb sprinklers have orange bulb protectors to minimize bulb damage during shipping, handling and installation. REMOVE THIS PROTECTION AT THE TIME THE SPRINKLER SYSTEM IS PLACED IN SERVICE FOR FIRE PROTECTION. Removal of the protectors before this time may leave the bulb vulnerable to damage. RASCO wrenches are designed to install sprinklers when covers are in place. REMOVE PROTECTORS BY UNDOING THE CLASP BY HAND. DO NOT USE TOOLS TO REMOVE THE PROTECTORS.

Maintenance

The Model F156-300 Upright, Pendent and Recessed Pendent Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluid. Remove any sprinkler that has been painted (other that factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged of operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

Escutcheon Data Table

Escutcheon Model	Adjustment	"A" Dimension	Face of Fitting to Ceiling or Wall Dimension
F1	Max Recessed Min Recessed	1½" (38.1mm) ¾" (19.1mm)	3/16" - 15/16" (5m - 24mm)
F2	Max Recessed Min Recessed	1½" (38.1mm) 1" (25mm)	3/16" - 11/16" (5m - 17mm)
FP Push-on/ Thread-off	Max Recessed Min Recessed	7/16" (11mm) 15/16" (24mm)	1½" (38.1mm) 1" (25mm)

Standard Temperature Rating

Classification	Sprinkler Temperature		Max. Ambient Temp.		Bulb Color
	°F	°C	°F	°C	
Ordinary	135	57	100°F	(38°C)	Orange
Ordinary	155	68	100°F	(38°C)	Red
Intermediate	175	79	150°F	(66°C)	Yellow
Intermediate	200	93	150°F	(66°C)	Green
High[1]	286	141	225°F	(107°C)	Blue
Extra High[1]	360	182	300°F	(149°C)	Mauve

[1] Not available for recessed sprinklers.

Maximum Working Pressure

300 psi (20.7 bar)

100% Factory tested hydrostatically to 600 psi (41.4 bar)

Finish[1]

Standard Finishes	
Sprinkler	**Escutcheon**
Bronze Chrome White or Black Polyester Coated[5]	Brass Chrome White Painted
Special Application Finishes	
Sprinkler	**Escutcheon**
Bright Brass [2] Black Plated Black Paint Off White Satin Chrome Lead Plated [3] Wax Coated [3][4] Wax Over Lead [3][4]	Bright Brass Black Plated Black Paint Off White Satin Chrome

[1] Other colors and finishes are available on special order. Consult factory for details.

[2] 200°F (93°C) maximum.

[3] 155°F to 200°F (68°C to 93°C) ratings only.

[4] 212°F (100°C) brown wax may be used on 286°F (141°C) sprinklers when maximum ceiling temperatures do not exceed 150°F (66°C).

[5] cULus Listed "Corrosion resistant" applies to SIN RA2514 (Pendent) and RA2525 (Upright) in standard black or white.

Note: Paint or any other coating applied over the factory finish will void approvals and waranties.

Ordering Information

Specify:

1. Sprinkler Model
2. Sprinkler Type
3. Orifice Size
4. Deflector Type
5. Temperature Rating
6. Sprinkler Finish
7. Escutcheon Finish (where applicable)

Note: When Model F156-300 Recessed Pendent Sprinklers are ordered, the sprinklers and escutcheons are packaged separately.

Reliable...For Complete Protection

Reliable offers a wide selection of sprinkler components. Following are some of the many precision-made Reliable products that guard life and property from fire around the clock.

- Automatic sprinklers
- Flush automatic sprinklers
- Recessed automatic sprinklers
- Concealed automatic sprinklers
- Adjustable automatic sprinklers
- Dry automatic sprinklers
- Intermediate level sprinklers
- Open sprinklers
- Spray nozzles
- Alarm valves
- Retarding chambers
- Dry pipe valves
- Accelerators for dry pipe valves
- Mechanical sprinkler alarms
- Electrical sprinkler alarm switches
- Water flow detectors
- Deluge valves
- Detector check valves
- Check valves
- Electrical system
- Sprinkler emergency cabinets
- Sprinkler wrenches
- Sprinkler escutcheons and guards
- Inspectors test connections
- Sight drains
- Ball drips and drum drips
- Control valve seals
- Air maintenance devices
- Air compressors
- Pressure gauges
- Identification signs
- Fire department connection

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Products manufactured and distributed by Reliable have been protecting life and property for over 90 years.

Manufactured by

Reliable®

Reliable Automatic Sprinkler Co., Inc.
(800) 431-1588 Sales Offices
(800) 848-6051 Sales Fax
(914) 829-2042 Corporate Offices
www.reliablesprinkler.com Internet Address

Recycled Paper

Revision lines indicate updated or new data.

EG. Printed in U.S.A. 04/18 P/N 9999970385

Bulletin 014 March 2019

Model F1FR Series Quick Response Glass Bulb Sprinklers

Model F1FR56 Sprinkler Types

Standard Spray Upright
Standard Spray Pendent
Conventional Upright/Pendent
Vertical Sidewall
Horizontal Sidewall

Model F1FR56 Recessed Sprinkler Types

Standard Spray Pendent
Horizontal Sidewall

Model F1FR56 Concealed Sprinkler Types

Standard Spray Pendent

Model F1FR42, F1FRXLH & F1FR28 Sprinkler Types

Standard Spray Upright
Standard Spray Pendent

Model F1FR40 Sprinkler Types

Standard Spray Pendent

Model F1FR42, F1FR40, F1FRXLH & F1FR28 Recessed Sprinkler Types

Standard Spray Pendent

Model F1FR56LL & F1FR42LL Low Lead Sprinkler Types

Standard Spray Pendent with less than 0.25% Lead Content

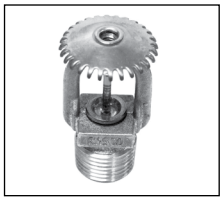
Listing & Approvals

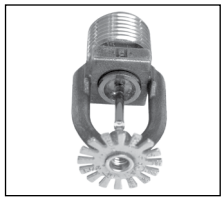
The following organizations provide Listings or Approvals for various Model F1FR series sprinklers. See the Design and Installation table in this Bulletin for information on specific listings and approvals applicable to each sprinkler.

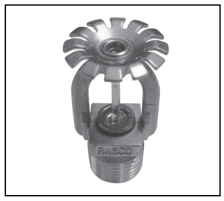
1. Underwriters Laboratories Inc. and Certified for Canada (cULus) in accordance with ANSI/UL199.
2. FM Approvals (FM)
3. Loss Prevention Certification Board (LPCB)
4. VdS Schadenverhütung GmbH (VdS)
5. Underwriters Laboratories Inc. and Underwriters Laboratories of Canada Certified for Health Effects to NSF/ANSI Standard 61 Annex G (ULH)
6. EC Certificate: 0786-CPD-40239 (RA1414), 0786-CPD-40251 (RA1425), 0786-CPD-40252 (RA1475) (EC)

UL Listing Category

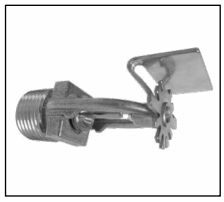
Sprinklers, Automatic & Open (VNIV)
Quick Response Sprinkler


Upright

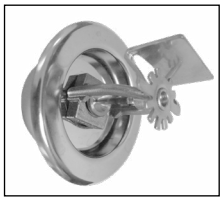

Pendent


Conventional

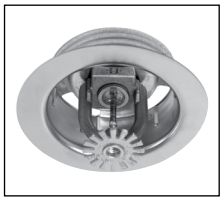

Vertical Sidewall

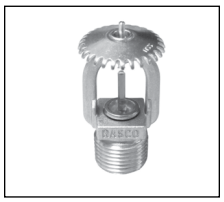

Horizontal Sidewall


Recessed Pendent/F1/F2


Recessed Horizontal Sidewall


Concealed Pendent


Recessed Pendent/FP


XLH Upright


XLH Pendent


XLH Recessed Pendent F1/F2


XLH Recessed Pendent FP

Product Description

Reliable Model F1FR series sprinklers are quick-response automatic sprinklers with a glass bulb thermal element. Model F1FR series sprinklers are Standard Spray sprinklers, with the exception of the Model F1FR56 Conventional sprinkler which is an Old-style/Conventional sprinkler.

The Model F1FR Series automatic sprinklers utilize a 3.0 mm frangible glass bulb. These sprinklers have demonstrated response times in laboratory tests which are five to ten times faster than standard response sprinklers. This quick response enables the Model F1FR Series sprinklers to apply water to a fire faster than standard-response sprinklers of the same temperature rating.

The glass bulb consists of an accurately controlled amount of special fluid hermetically sealed inside a precisely manufactured glass capsule. This glass bulb is specially constructed to provide fast thermal response.

At normal temperatures, the glass bulb contains the fluid in both the liquid and vapor phases. The vapor phase can be seen as a small bubble. As heat is applied, the liquid expands, forcing the bubble smaller and smaller as the liquid pressure increases. Continued heating forces the liquid to push out against the bulb, causing the glass to shatter, opening the waterway and allowing the deflector to distribute the discharging water.

Model F1FR Series sprinklers provide a wide range of options where quick-response, glass bulb sprinklers are used:

- Pendent, recessed pendent, upright, horizontal sidewall, and vertical sidewall deflectors
- K-factors of 2.8 (40 metric), 4.0 (57 metric), 4.2 (60 metric), and 5.6 (80 metric)
- Flush, recessed, and concealed installations

See the Design and Installation Information table in this Bulletin for information on the approvals and availability of specific Model F1FR series sprinkler configurations.

Model F1FR Recessed Pendent and Recessed Horizontal Sidewall sprinklers are required to be used with Reliable Model F1, F2, or FP recessed escutcheons. See the Recessed Escutcheon Data table in this Bulletin for listing and approval information with each specific Model F1FR series sprinkler. Model F1 and F2 recessed escutcheons, shown in Fig. 1 and 3, are a friction fit assembly allowing for 3/4-inch (19mm) and 1/2-inch (12.7mm) of adjustment, respectively. Model FP recessed escutcheons, shown in Fig. 2, provide a 1/2-inch (12.7mm) threaded adjustment.

Model F1FR56 Concealed Pendent and Model F1FR56LL Concealed Pendent sprinklers are required to be used with Model CCP cover plates. A standard profile Model CCP cover plate is available that provides up to 1/2-inch (12.7mm) of cover plate adjustment. In addition, a low profile Model CCP cover plate is also available that provides up to 5/16-inch (8.0mm) of cover plate adjustment. See the Design and Installation Information and Listed and Approved Temperature Ratings tables in this Bulletin for further information on approved cover plate options.

Application

Model F1FR Series sprinklers are intended for use in accordance with NFPA 13, FM Property Loss Prevention Data Sheets, and the requirements of the Authority Having Jurisdiction. Care must be exercised that the k-factor, temperature rating, deflector style, and sprinkler type are in accordance with the requirements of the applicable design and installation standards. In addition, Model F1FR Series sprinklers must be used in accordance with their listings and approvals, as well as the information provided in this Bulletin.

Installation

Glass bulb sprinklers have orange bulb protectors or protective caps to minimize bulb damage during shipping, handling and installation. Reliable sprinkler installation wrenches are designed to install sprinklers with bulb protectors in place. Remove the bulb protector at the time when the sprinkler system is placed in service for fire protection. Removal of the bulb protector before this time may leave the bulb vulnerable to damage. Remove bulb protectors by undoing the clasp by hand. Do not use tools to remove bulb protectors.

Model F1FR Series sprinklers must be installed with the Reliable sprinkler installation wrench identified in the Design and Installation Information table in this Bulletin. Any other wrench may damage the sprinkler. A leak tight sprinkler joint can be obtained with a torque of 8 to 18 lb-ft (11 to 24 N-m). Do not tighten sprinklers over the maximum recommended installation torque. Exceeding the maximum recommended installation torque may cause leakage or impairment of the sprinkler.

Recessed Sprinklers

Model F1FR Series Recessed sprinklers are to be installed as shown in Fig. 1, Fig. 2, or Fig. 3, as applicable to the specific model being installed. The Recessed Escutcheon Data table in the Bulletin identifies the only recessed escutcheons that are permitted to be used with each Model F1FR Series Recessed sprinkler. The use of any other recessed escutcheon will void all approvals and negate all warranties.

Concealed Sprinklers

Model F1FR Series Concealed Pendent sprinklers are to be installed as shown in Fig. 4 or Fig. 5, as applicable to the selected cover plate. Model F1FR56 Concealed Pendent and Model F1FR56LL Concealed Pendent sprinklers have a factory-installed Model CCP cup. A protective cap is installed at the factory that should remain on the sprinkler until the sprinkler is installed and should then be reinstalled on the sprinkler until the cover plate is installed. The concealed sprinkler assemblies are completed by the installation of a Model CCP push-on/thread-off cover plate assembly. The cover plate and sprinkler cup assemblies are joined using a cover plate skirt with flexible tabs for threaded engagement. A choice of two Model CCP cover plate assemblies provides either 1/2-inch (13mm) or 5/8-inch (8mm) of cover adjustment. Do not install Model F1FR Series Concealed Pendent sprinklers in ceilings which have positive pressure in the space above.

Model F1FR Series Concealed Pendent sprinklers require a 2-5/8-inch (67mm) diameter hole to be cut in the ceiling. The Model GFR2 wrench is used to engage the sprinkler wrenching surfaces and to install the sprinkler in the fitting. Remove the protective cap to install the sprinkler, then reinstall the protective cap until the cover plate is installed. When inserting or removing the wrench from the sprinkler/cup assembly, care should be taken to prevent damage to the sprinkler. Do not wrench any other part of the sprinkler/cup assembly. Installation is completed by removing the protective cap from the sprinkler and pushing the cover plate onto the cup. Final adjustment is made by hand turning the cover plate until the skirt flange makes full contact with the ceiling. Cover plate removal requires turning the cover plate in the counter clockwise direction. After installation, inspect all sprinklers to ensure that there is a gap between the cover plate and ceiling and that the four cup slots are open and free from any air flow impediment to the space above.

Concealed cover plate/cup assemblies are listed only for use with specific sprinklers. The use of any concealed cover plate/cup assembly other than the Reliable Model CCP with Model F1FR56 Concealed Pendent and Model F1FR56LL Concealed Pendent sprinklers or the use of the Model CCP Concealed cover plate assembly on any sprinkler with which it is not specifically listed my prevent good fire protection and will void all guarantees, warranties, listings and approvals.

Technical Data:

Sensitivity: Quick-response
Thread Size: 1/2-inch NPT standard; ISO 7-R1/2 optional
Maximum Working Pressure: 175 psi (12 bar) - 100% Factory tested hydrostatically to 500 psi (34.5 bar)
SIN RA1425, RA1414 & RA1435 cULus listed for 250 psi (17 bar)

Design and Installation Information											
Model	Nominal K-factor		Nominal Orifice Diameter		Deflector/ Orientation	Nominal Sprinkler Height		Installation Wrench	SIN	Listings and Approvals	Approval Notes
	US	Metric	inches	mm		inches	mm				
F1FR28	2.8	40	3/8	10	Pendent	2.25	57	W2	RA1411	cULus	2
					Recessed Pendent	2.25	57	GFR2	RA1411	cULus	2
					Upright	2.25	57	W2	RA1421	cULus	1,2
F1FR40	4.0	57	3/8	10	Pendent	2.25	57	W2	RA1418	VdS	
					Recessed Pendent	2.25	57	GFR2	RA1418	VdS	
F1FR42	4.2	60	7/16	10	Pendent	2.25	57	W2	RA1413	cULus	2
					Recessed Pendent	2.25	57	GFR2	RA1413	cULus	2
					Upright	2.25	57	W2	RA1423	cULus	1,2
F1FR42LL	4.2	60	7/16	10	Pendent	2.25	57	W2	RA1410	cULus, ULH	
					Recessed Pendent	2.25	57	GFR2	RA1410	cULus, ULH	
F1FRXLH (F1FR42 with Pintle)	4.2	60	7/16	10	Pendent	2.25	57	W2	RA1413	cULus	2
					Recessed Pendent	2.25	57	GFR2	RA1413	cULus	2
					Upright	2.25	57	W2	RA1423	cULus	1,2
F1FR56	5.6	80	1/2	15	Pendent	2.25	57	W2	RA1414	cULus, FM, LPCB, VdS, EC	1,2,3,4
					Recessed Pendent	2.25	57	GFR2	RA1414	cULus, FM, LPCB, VdS, EC	1,2,3,4
					Concealed Pendent	2.25	57	GFR2	RA1414	cULus,VdS,EC	5,6
					Upright	2.25	57	W2	RA1425	cULus, FM, LPCB, VdS, EC	1,2,3,4
					"Conventional (Pendent or Upright)"	2.25	57	W2	RA1475	LPCB, VdS, EC	4
F1FR56LL	5.6	80	1/2	15	Pendent	2.25	57	W2	RA1415	cULus, ULH	1
					Recessed Pendent	2.25	57	GFR2	RA1415	cULus, ULH	
					Concealed Pendent	2.25	57	GFR2	RA1415	cULus, ULH	6
F1FR56	5.6	80	1/2	15	Horizontal Sidewall	2.63	67	W2	RA1435	cULus, FM	1,2,3,7
					Recessed Horizontal Sidewall	2.63	67	GFR2	RA1435	cULus, FM	8
F1FR56	5.6	80	1/2	15	Vertical Sidewall (Pendent or Upright)	2.25	57	W2	RA1485	cULus, FM, LPCB	1,2,3,9

(1) cULus Listed Corrosion Resistant sprinkler when ordered with available Polyester coating.
(2) cULus Listed Corrosion Resistant sprinkler when ordered with available Electroless Nickel PTFE plating.
(3) Available with FM approved Polyester coating in black or white.
(4) Available with LPCB and VdS approved Polyester coating.
(5) VdS and EC approvals of the F1FR56 Concealed Pendent sprinkler are for 155°F (68°C) temperature rated sprinklers only. VdS approved sprinklers must use Norbulb brand glass bulbs with the 1/2-inch (12.7mm) adjustment Model CCP cover plate only.
(6) Model F1FR56 Concealed Pendent and Model F1FR56LL Concealed Pendent sprinklers must be used with Reliable Model CCP cover plates, available as either standard depth with 1/2-inch (12.7mm) of adjustment or low profile with 5/16-inch (8.0 mm) of adjustment.
(7) cULus Listing of the F1FR56 Horizontal Sidewall sprinkler is for Light and Ordinary Hazard occupancies only. Minimum to maximum deflector to ceiling distance shall be 4 inches to 12 inches (102mm to 305mm). FM Approval of the F1FR56 Horizontal Sidewall sprinkler is for Light Hazard occupancies only.
(8) cULus Listing and FM Approval of the F1FR56 Recessed Horizontal Sidewall sprinkler is for Light Hazard occupancies only.
(9) The F1FR56 Vertical Sidewall sprinkler is listed and approved for use only in Light Hazard occupancies. LPCB approval of the F1FR56 Vertical Sidewall sprinkler is for installation in the Pendent position only.

Listed and Approved Temperature Ratings

Model	Deflector/ Orientation	Ordinary Temp. Classification 100°F (38°C) Max. Ambient Temp.		Intermediate Temp. Classification 150°F (65°C) Max. Ambient Temp.		High Temp. Classification 225°F (107°C) Max. Ambient Temp.
		135°F (57°C) Temp. Rating	155°F (68°C) Temp. Rating	175°F (79°C) Temp. Rating	200°F (93°C) Temp. Rating	286°F (141°C) Temp. Rating
		Orange Bulb	Red Bulb	Yellow Bulb	Green Bulb	Blue Bulb
F1FR28	Pendent	cULus				
	Recessed Pendent	cULus				
	Upright	cULus				
F1FR40	Pendent	VdS				
	Recessed Pendent	VdS				
F1FR42	Pendent	cULus				
	Recessed Pendent	cULus				
	Upright	cULus				
F1FR42LL	Pendent				cULus, ULH	
	Recessed Pendent				cULus, ULH	
F1FRXLH	Pendent	cULus				
	Recessed Pendent	cULus				
	Upright	cULus				
F1FR56	Pendent	cULus, FM, LPCB, VdS, EC				
	Recessed Pendent	cULus, FM, LPCB, VdS, EC				
	Concealed Pendent*	cULus	cULus,VdS,EC	cULus		
	Upright	cULus, FM, LPCB, VdS, EC				
	"Conventional (Pendent or Upright)"	LPCB, VdS, EC				
F1FR56LL	Pendent				cULus, ULH	
	Recessed Pendent				cULus, ULH	
	Concealed Pendent*				cULus, ULH	
F1FR56	Horizontal Sidewall	cULus, FM				
	Recessed Horizontal Sidewall	cULus, FM				
F1FR56	Vertical Sidewall (Pendent or Upright)	cULus, FM, LPCB				

* Model F1FR56 Concealed Pendent and F1FR56LL Concealed Pendent sprinklers must be used with Reliable Model CCP cover plates. For Ordinary Temperature Classification sprinklers use a 135°F (57°C) temperature rated cover plate. For Intermediate Temperature Classification sprinklers use a 165°F (74°C) temperature rated cover plate.

Recessed Escutcheon Data

Model	Deflector/ Orientation	Listed and Approved Recessed Escutcheons			SIN
		Model F1 (Fig. 1 & 3) 3/4-inch (19mm) adjustment	Model F2 (Fig. 1 & 3) 1/2-inch (12.7mm) adjustment	Model FP (Fig. 2) 1/2-inch (12.7mm) adjustment	
F1FR28	Recessed Pendent	cULus	cULus	cULus	RA1411
F1FR40	Recessed Pendent	VdS	VdS	VdS	RA1418
F1FR42	Recessed Pendent	cULus	cULus	cULus	RA1413
F1FR42LL	Recessed Pendent	cULus, ULH	cULus, ULH	cULus, ULH	RA1410
F1FR42XLH	Recessed Pendent	cULus	cULus	cULus	RA1413
F1FR56	Recessed Pendent	cULus, LPCB, VdS, EC	cULus, FM, LPCB, VdS, EC	cULus, VdS, EC	RA1414
F1FR56LL	Recessed Pendent	cULus, ULH	cULus, ULH	cULus, ULH	RA1415
F1FR56	Recessed Horizontal Sidewall	cULus	cULus, FM	cULus	RA1435

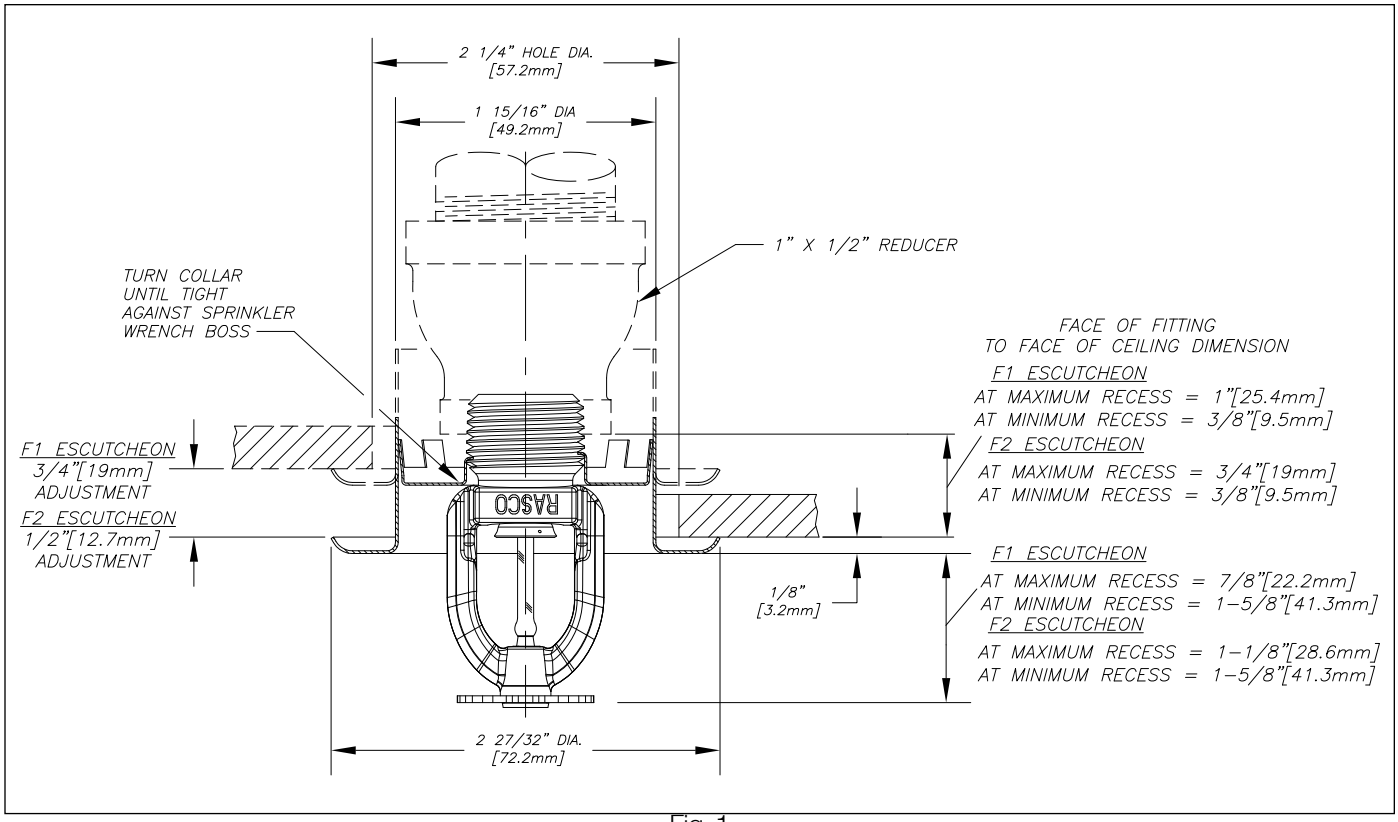


Fig. 1
Model F1FR56, F1FR56LL, F1FR42, F1FR40, F1FR42LL, F1FRXLH & F1FR28
Recessed Pendent sprinkler with Model F1 or F2 escutcheon

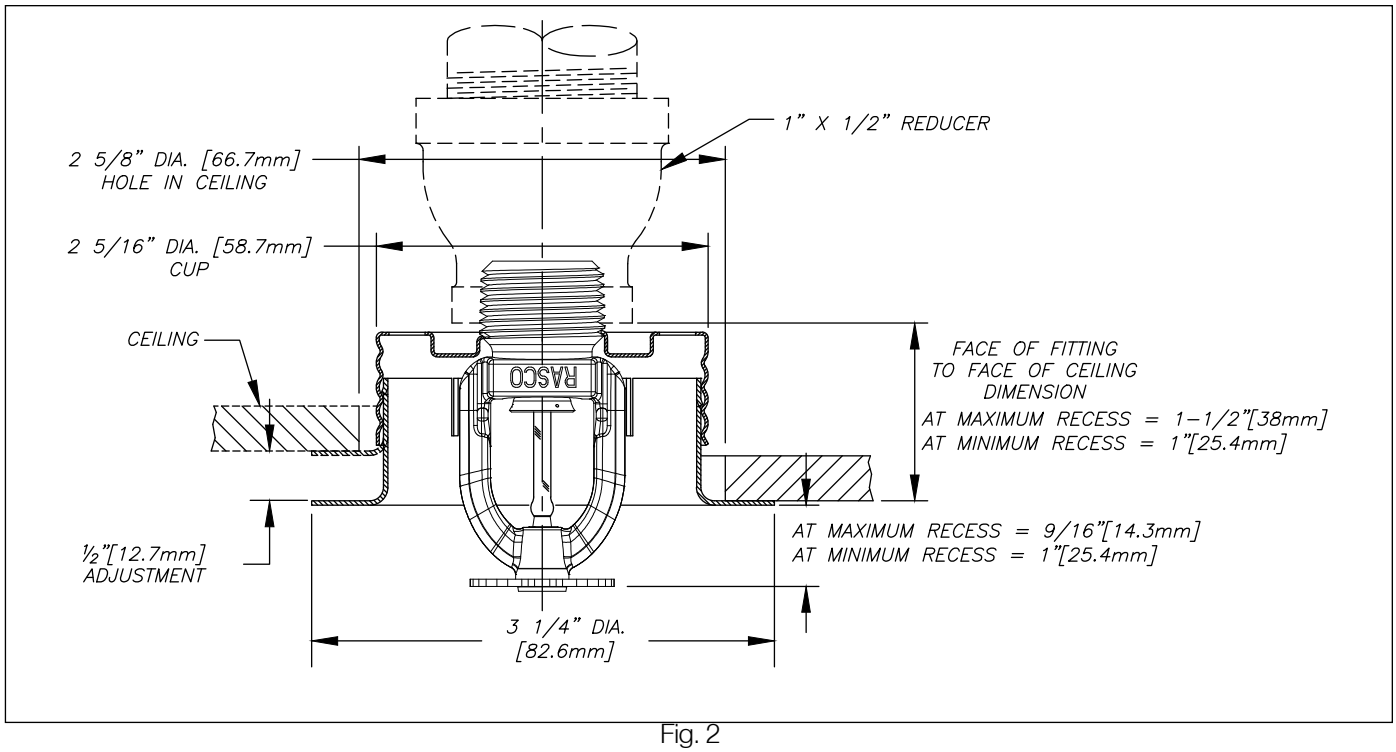


Fig. 2
Model F1FR56, F1FR56LL, F1FR42, F1FR40, F1FR42LL, F1FRXLH & F1FR28
Recessed Pendent sprinkler with Model FP escutcheon

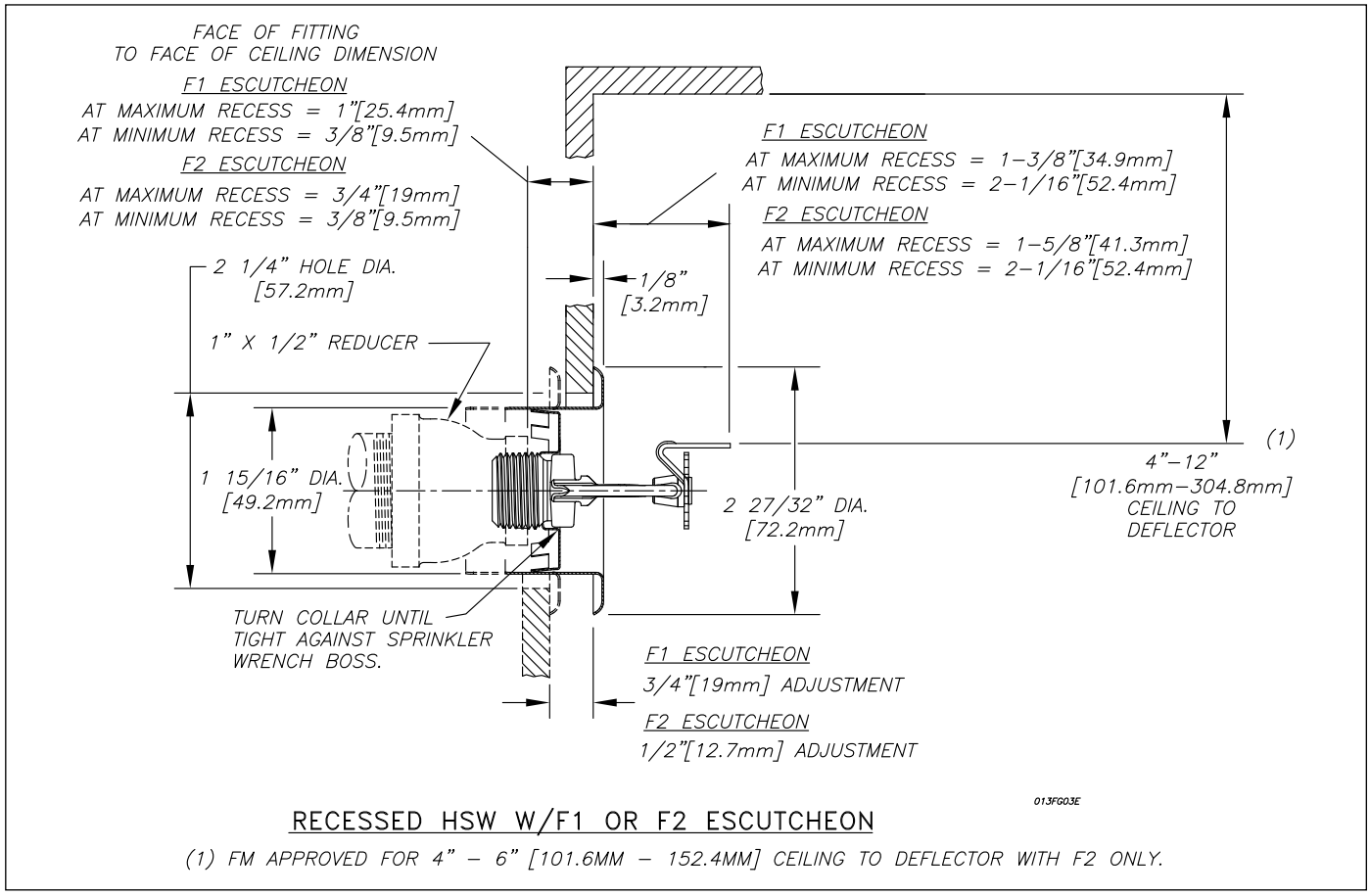


Fig. 3
Model F1FR56 Recessed Horizontal Sidewall sprinkler with Model F1 or F2 escutcheon

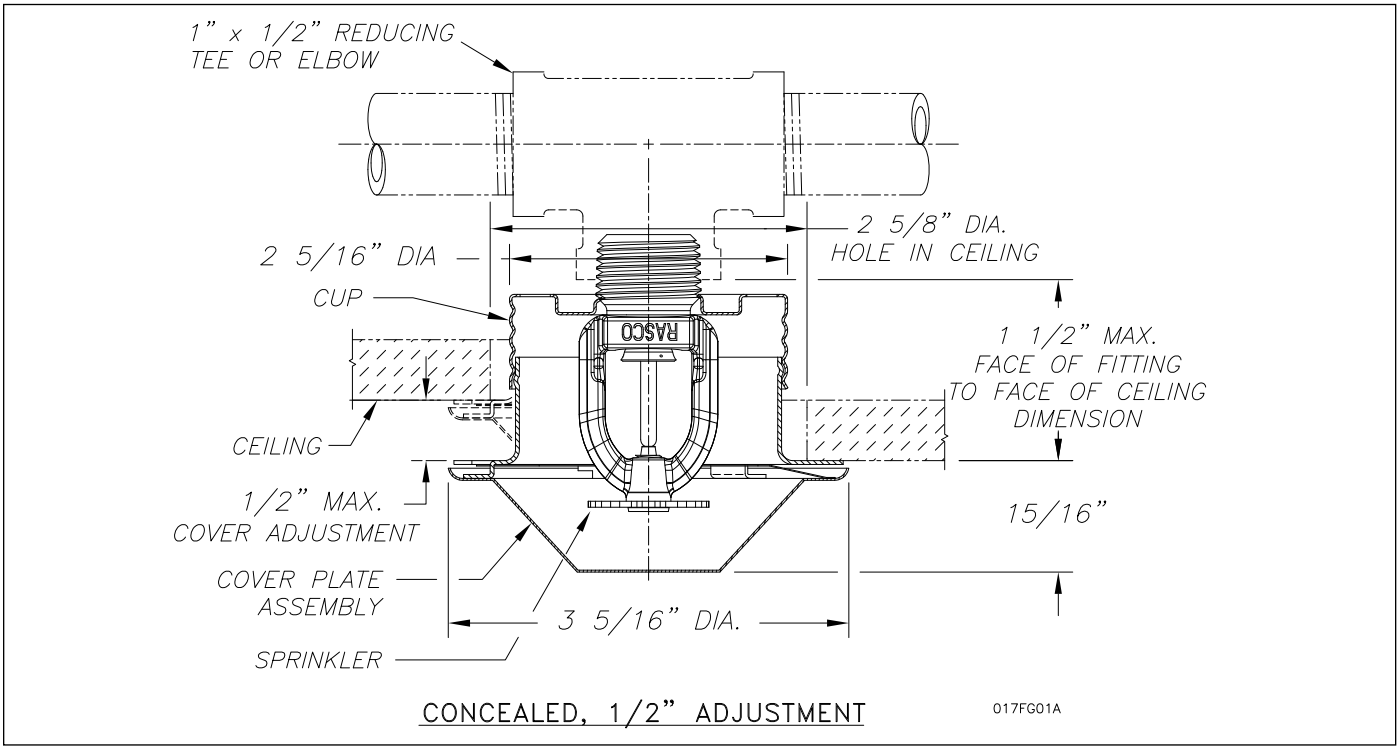


Fig. 4
Model F1FR56/F1FR56LL Concealed Pendent sprinkler with standard depth
1/2-inch (12.7mm) adjustment - Model CCP cover plate

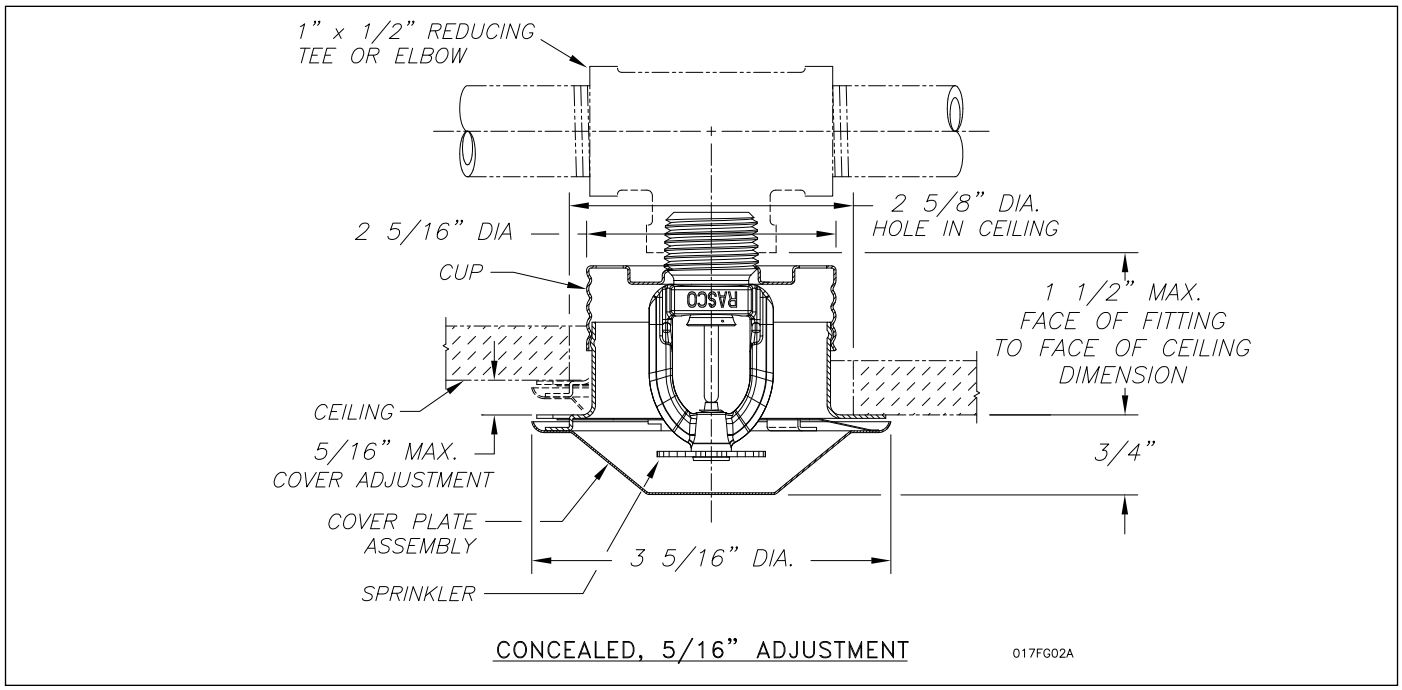


Fig. 5 - Model F1FR56/F1FR56LL Concealed Pendent sprinkler with low profile 5/16-inch (8.0mm) adjustment - Model CCP cover plate

Maintenance

The Model F1FR Series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Remove dust by using a soft brush or gentle vacuuming. Replace any sprinkler which has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers.

Finishes [1]

Standard Finishes		
Sprinkler	**Escutcheon**	**Cover plate[1]**
Bronze	Brass	Chrome
Chrome Plated	Chrome Plated	White
Polyester Coated [4][5][6]	White Painted	
Special Application Finishes		
Sprinkler	**Escutcheon**	**Cover plate[1]**
Electroless Nickel PTFE[7]	Electroless Nickel PTFE	Bright Brass
Bright Brass[3]	Bright Brass	Black Plating
Black Plated	Black Plated	Black Paint
Black Paint[2][6]	Black Paint	Off White
Off White[2][6]	Off White	Satin Chrome
Chrome Dull	Chrome Dull	

[1] Other finishes and colors are available on special order. Consult the factory for details. Custom color painted sprinklers may not retain their UL Corrosion resistance listing. Coverplate custom paint is semi-gloss, unless specified otherwise.

[2] cULus Listed only.

[3] 200°F (93°C) maximum.

[4] cULus listed "corrosion resistance" applies to SIN Numbers RA1435 (HSW), RA1485(VSW), RA1425 (Upright), RA1414 (Pendent) and RA1415 (Pendent) in standard black or white. Corrosion resistance in other polyester colors is available upon request.

[5] FM Approvals finish as "Polyester coated" applies to SIN Number RA1414, RA1435 and RA1425 in standard black or white.

[6] LPCB and VdS Approved finish applies only to RA1425, RA1414, RA1418 (VdS) and RA1475.

[7] cULus listed Corrosion Resistant

Material Data	
Frame:	DZR Brass, QM Brass, or Low Lead Brass
Deflector:	CDA Alloy 220, 260, or 510
Load Screw\Pintle:	CDA Alloy 360 or 544
Cup:	CDA Alloy 651 or 693
Washer:	Nickel Alloy 440 or 360, coated with PTFE Adhesive Tape
Bulb:	Glass

Ordering Information

Specify:

1. Sprinkler Model: [F1FR28][F1FR40][F1FR42] [F1FR42LL][F1FRXLH][F1FR56][F1FR56LL]
2. Sprinkler Deflector/Orientation: [Pendent][Recessed Pendent][Upright][Conventional][Horizontal Sidewall] [Recessed Horizontal Sidewall][Vertical Sidewall]
3. Sprinkler threads: [1/2-inch NPT][ISO 7-R1/2]
4. Sprinkler Temperature Rating: [135°F (57°C)][155°F (68°C)][175°F (79°C)][200°F (93°C)][286°F (141°C)]
5. Sprinkler Finish
6. Escutcheon Model: [F1][F2][FP]
7. Escutcheon Finish (where applicable)
8. Cover plate Model: [standard profile CCP 1/2-inch (12.7mm) adjustment][low profile CCP 5/16-inch (8.0mm) adjustment]
9. Cover plate Temperature Rating: [135°F (57°C) for use with Ordinary Temperature sprinklers][165°F (74°C) for use with Intermediate Temperature sprinklers]
10. Cover plate Finish

Note: When Model F1FR Series Recessed sprinklers are ordered, the sprinklers and escutcheons are packaged separately.

Reliable...For Complete Protection

Reliable offers a wide selection of sprinkler components. Following are some of the many precision-made Reliable products that guard life and property from fire around the clock.

- Automatic sprinklers
- Flush automatic sprinklers
- Recessed automatic sprinklers
- Concealed automatic sprinklers
- Adjustable automatic sprinklers
- Dry automatic sprinklers
- Intermediate level sprinklers
- Open sprinklers
- Spray nozzles
- Alarm valves
- Retarding chambers
- Dry pipe valves
- Accelerators for dry pipe valves
- Mechanical sprinkler alarms
- Electrical sprinkler alarm switches
- Water flow detectors
- Deluge valves
- Detector check valves
- Check valves
- Electrical system
- Sprinkler emergency cabinets
- Sprinkler wrenches
- Sprinkler escutcheons and guards
- Inspectors test connections
- Sight drains
- Ball drips and drum drips
- Control valve seals
- Air maintenance devices
- Air compressors
- Pressure gauges
- Identification signs
- Fire department connection

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable. Products manufactured and distributed by Reliable have been protecting life and property for almost 100 years.

Manufactured by

Reliable®

Reliable Automatic Sprinkler Co., Inc.
(800) 431-1588 Sales Offices
(800) 848-6051 Sales Fax
(914) 829-2042 Corporate Offices
www.reliablesprinkler.com Internet Address

Recycled Paper

Revision lines indicate updated or new data.

EG. Printed in U.S.A. 03/19 P/N 9999970300

Reliable®

Model KFR56 Series Sprinklers

Quick-response, Standard Spray Fusible Link Sprinklers

K5.6 (80 metric)
cULus Listed, FM Approved, VdS Approved, CE Certified

Product Description

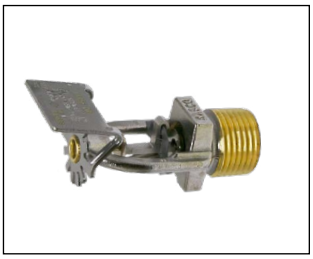
Model KFR56 series sprinklers are standard spray, quick-response sprinklers with a fusible link operating element. The sprinklers are cULus Listed, FM Approved, VdS Approved, and CE Certified. See Table C for available finishes. All KFR56 sprinklers have a nominal K-factor of 5.6 (80 metric).

Model KFR56 series sprinklers are available in Ordinary (165°F [74°C]) or Intermediate (212°F [100°C]) temperature classification. Model KFR56 Pendent sprinklers are available with Model F1, Model F2, or Model FP recessed escutcheons.

Model KFR56 Pendent

Model KFR56 Upright

Model CCP



Model KFR56 HSW

Application

Model KFR56 series sprinklers are listed and approved for installation in accordance with NFPA 13 and FM Loss Prevention Data Sheets. Follow requirements of NFPA 13 for Quick-response Standard Spray Sprinklers when installing Model KFR56 series sprinklers. FM Approvals classifies Model KFR56 sprinklers as K5.6 QR Non-storage and K5.6 QR In-rack Storage sprinklers.

Installation

Model KFR56 series sprinklers must be installed in accordance with the requirements of NFPA 13 or FM Property Loss Prevention Data Sheets. The Model F1, F2, and FP escutcheons are the only recessed escutcheons listed and approved for use with Model KFR56 Pendent sprinklers. The use of any other recessed escutcheon will void all approvals and warranties. Do not install Model FP escutcheons in ceilings that are positively pressurized with respect to the occupied space below.

Use only the Model W2 sprinkler wrench for installing Model KFR56 series pendent, upright, and horizontal sidewall sprinklers, and use only the Model W1 wrench for installing Model KFR56 series recessed pendent, conical concealed pendent (CCP), and recessed horizontal sidewall sprinklers. The use of wrenches other than those specified may damage these sprinklers.

Recommended installation torque is 14-20 ft-lbs (19 – 27 N-m). Do not tighten sprinklers over the maximum recommended torque. Exceeding the maximum recommended torque may cause leakage or impairment of the sprinklers.

Listings & Approvals

Listed by Underwriters Laboratories, Inc. and UL Certified for Canada (cULus)

- Sprinklers, Automatic and Open (VNIV)

FM Approved (FM)

- K5.6 QR Non-storage
- K5.6 QR In-rack Storage

VdS Approved and CE Certified to EN12259

Model KFR Series Sprinkler Summary — **Table A**

Sprinkler Model	Orientation	Listing or Approval	Max. Working Pressure psi (bar)	Sprinkler Identification Number (SIN)
KFR56 Pendent	Pendent	cULus	250 (17.2)	RA3614
		FM, VdS, CE	175 (12)	
KFR56 Upright KFR56 Upright Intermediate	Upright	cULus	250 (17.2)	RA3624
		FM, VdS, CE	175 (12)	
KFR56 HSW	HSW	cULus	250 (17.2)	RA3634
		FM, VdS, CE	175 (12)	

Model KFR56 Pendent sprinkler — SIN RA3614

Technical Specifications
Style: Pendent, Recessed Pendent, or Conical Concealed Pendent
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
cULus: 250 psi (17.2 bar)
FM, VdS, CE: 175 psi (12 bar)

Material Specifications
Thermal Sensor: Beryllium Nickel
Strut and Lever: Stainless Steel
Roto-clip: Stainless Steel
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Wrenches
Model W2 (pendent)
Model W1 (recessed)
Model J (with guard installed)

Listings and Approvals
cULus Listed
FM Approved
VdS Approved
CE Certificate of constancy of performance
0786-CPR40313

Sprinkler Finishes
(See Table C)

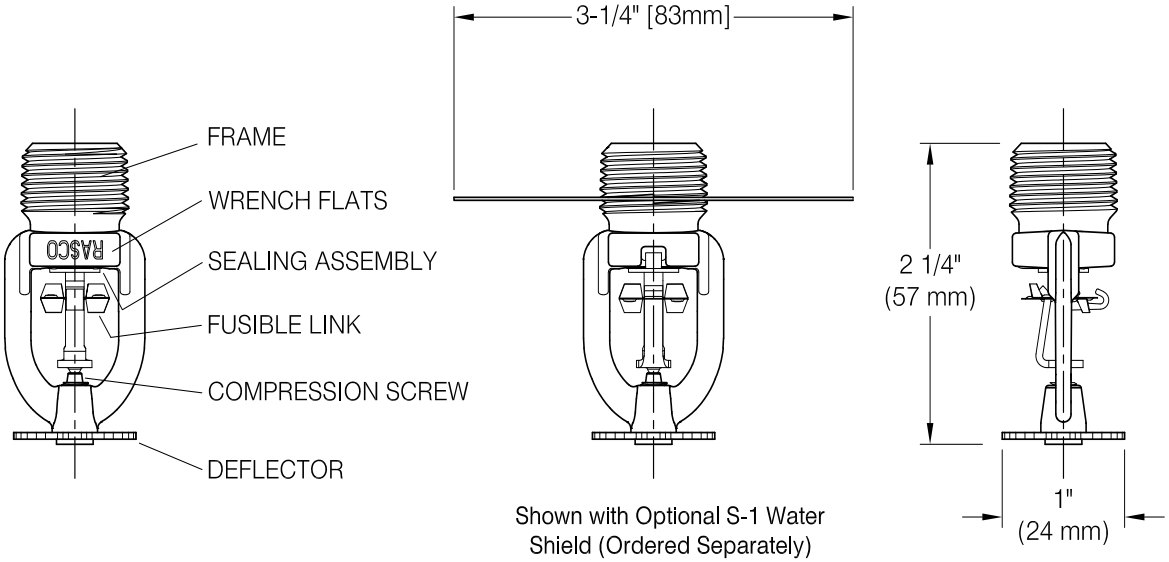
Sensitivity
Quick-response

Temperature Ratings
165°F (74°C)
212°F (100°C)

Recessed Escutcheons/Cover Plates
Model F1 escutcheon (cULus only)
Model F2 escutcheon
Model FP escutcheon (cULus only)
Model CCP cover plate (cULus only)

Guards/Water Shields
F-7 Guard (cULus)
F-1 Guard (FM)
F-8 Guard/Water Shield (cULus)
F-5 Guard/Water Shield (FM)
S-1 Water Shield (cULus, FM)

Model KFR56 Pendent Sprinkler Components and Dimensions — **Figure 1**



Model KFR56 Upright Sprinkler — SIN RA3624

Technical Specifications
Style: Upright
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
cULus: 250 psi (17.2 bar)
FM, VdS, CE: 175 psi (12 bar)

Material Specifications
Thermal Sensor: Beryllium Nickel
Strut and Lever: Stainless Steel
Roto-clip: Stainless Steel
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Wrench
Model W2
Model J (with guard installed)

Listings and Approvals
cULus Listed
FM Approved
VdS Approved
CE Certificate of constancy of performance
0786-CPR40314

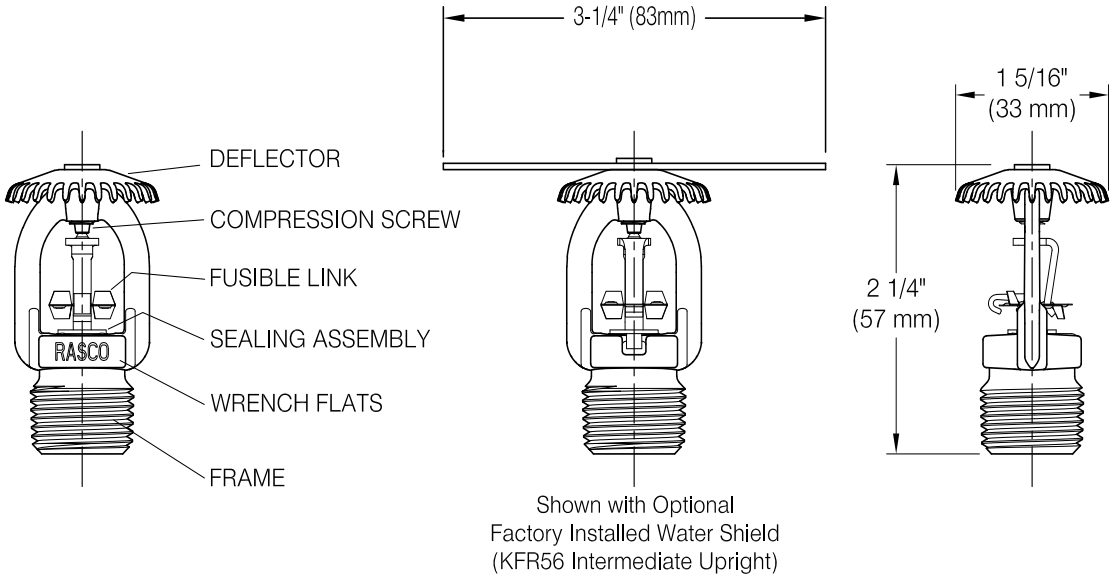
Sprinkler Finishes
(See Table C)

Sensitivity
Quick-response

Temperature Ratings
165°F (74°C)
212°F (100°C)

Guards/Water Shields
F-1 Guard (cULus, FM)
F-3 Guard/Water Shield (cULus, FM)
Factory Installed Shield (cULus, FM)

Model KFR56 Upright Sprinkler Components and Dimensions — **Figure 2**



Model KFR56 HSW Horizontal Sidewall Sprinkler — SIN RA3634

Technical Specifications
Style: HSW or Recessed HSW
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
cULus: 250 psi (17.2 bar)
FM, VdS, CE: 175 psi (12 bar)

Material Specifications
Thermal Sensor: Beryllium Nickel
Strut and Lever: Stainless Steel
Roto-clip: Stainless Steel
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Wrenches
Model W2 (HSW)
Model W1 (recessed)
Model J (with guard installed)

Listings and Approvals
cULus Listed
FM Approved
VdS Approved
CE Certificate of constancy of performance
0786-CPR40312

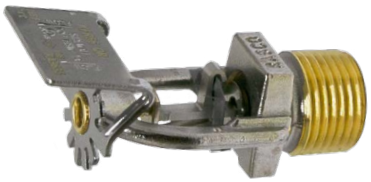
Sprinkler Finishes
(See Table C)

Sensitivity
Quick-response

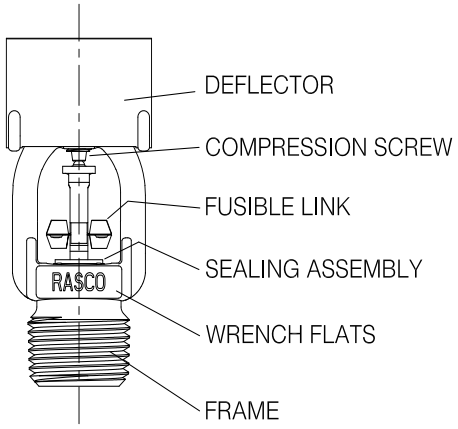
Temperature Ratings
165°F (74°C)
212°F (100°C)

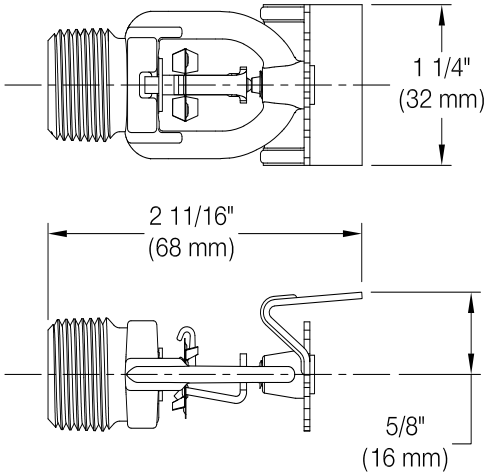
Recessed Escutcheons
Model F1 escutcheon (cULus only)
Model F2 escutcheon
Model FP escutcheon (cULus only)

Guards
F-7 Guard (cULus)
F-4 Guard (FM)



Model KFR56 HSW Sprinkler Components and Dimensions — Figure 3



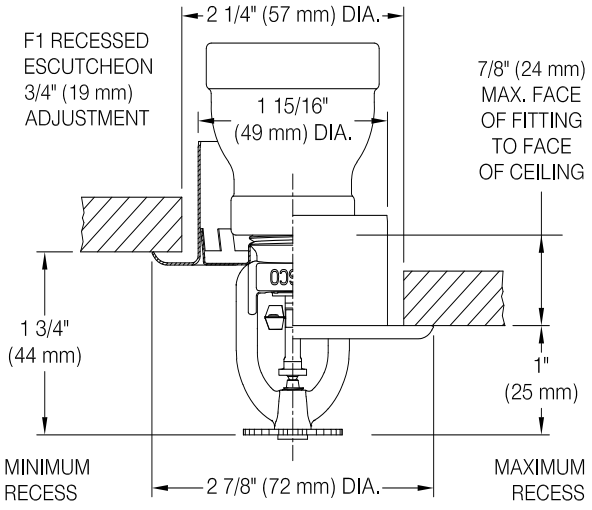


Recessed Escutcheon and Conical Concealed Cover Plate Dimensions — **Table B**

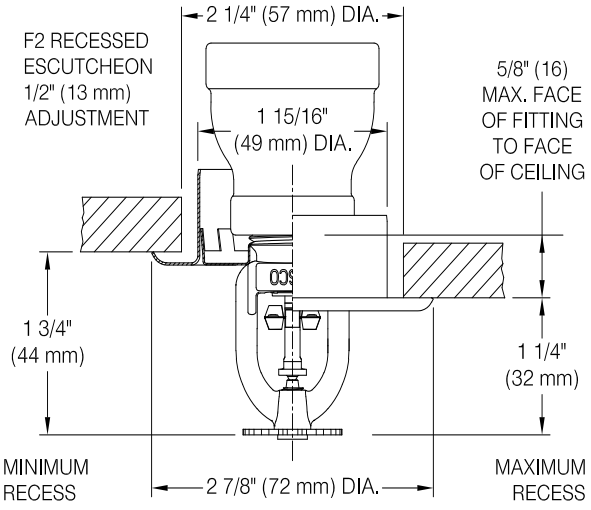
Type	Adjustment Inch (mm)	Maximum Face of Fitting to Ceiling* Inch (mm)	Minimum Face of Fitting to Ceiling* Inch (mm)	Maximum Deflector Distance Below Ceiling Inch (mm)	Minimum Deflector Distance Below Ceiling Inch (mm)
F1	3/4 (19)	7/8 (24)	1/8 (3)	1-3/4 (44)	1 (25)
F2	1/2 (12)	5/8 (16)	1/8 (3)	1-3/4 (44)	1-1/4 (32)
FP	1/2 (12)	1-1/2 (38)	1 (25)	1 (25)	1/2 (12)
CCP	1/2 (12)	1-1/2 (38)	1 (25)	1 (25)	1/2 (12)

***Note:** Face of fitting to ceiling dimensions are based on nominal thread make up. Verify dimensions based on fitting and thread sealing method prior to installation.

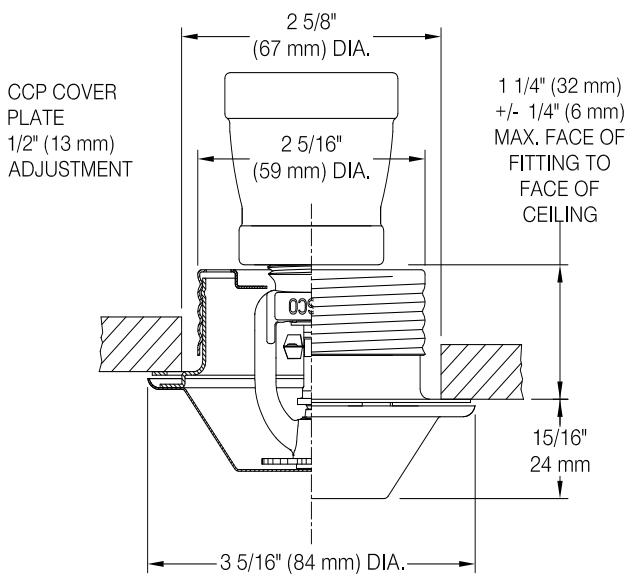
Recessed Escutcheon and Conical Concealed Cover Plate Diagrams — **Figure 4**



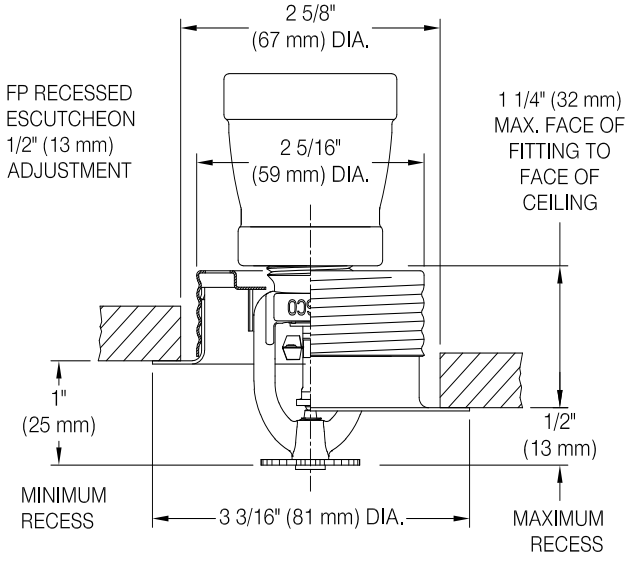
F1 RECESSED ESCUTCHEON INSTALLATION



F2 RECESSED ESCUTCHEON INSTALLATION



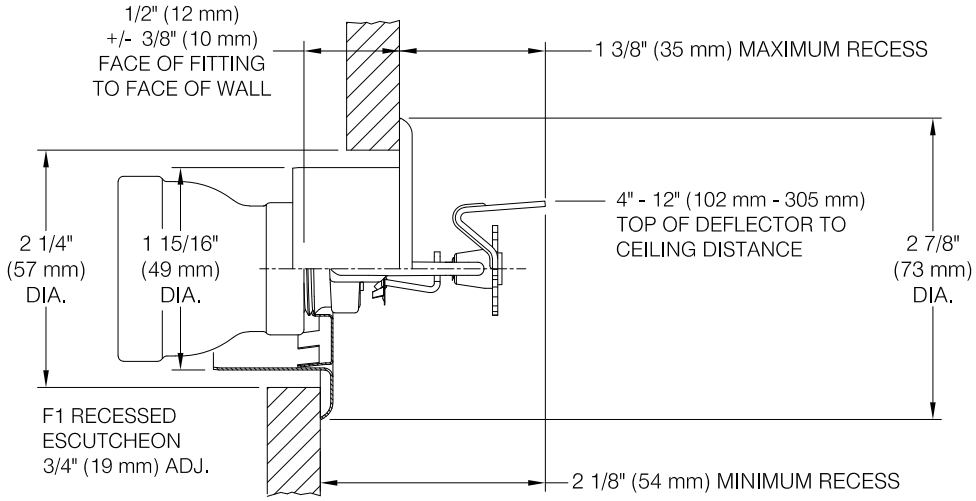
CCP COVER PLATE INSTALLATION



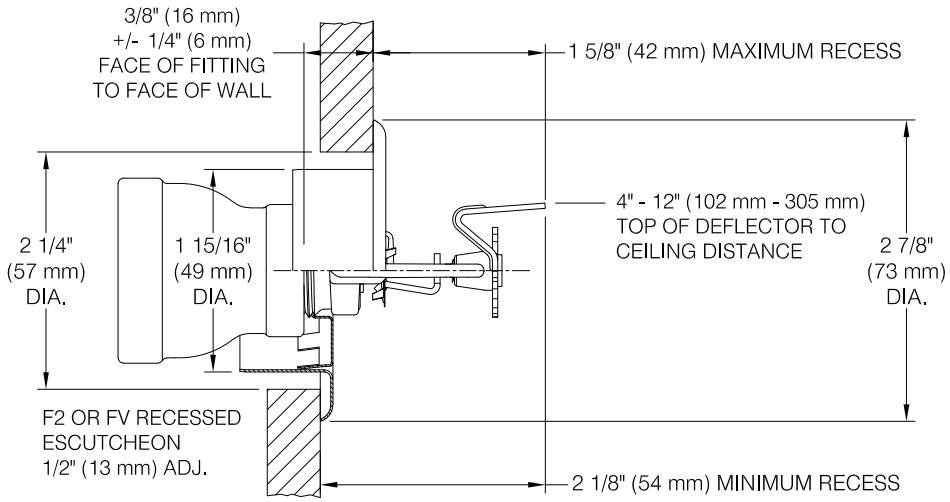
FP RECESSED ESCUTCHEON INSTALLATION

Model KFR56 HSW Recessed Escutcheon Diagrams

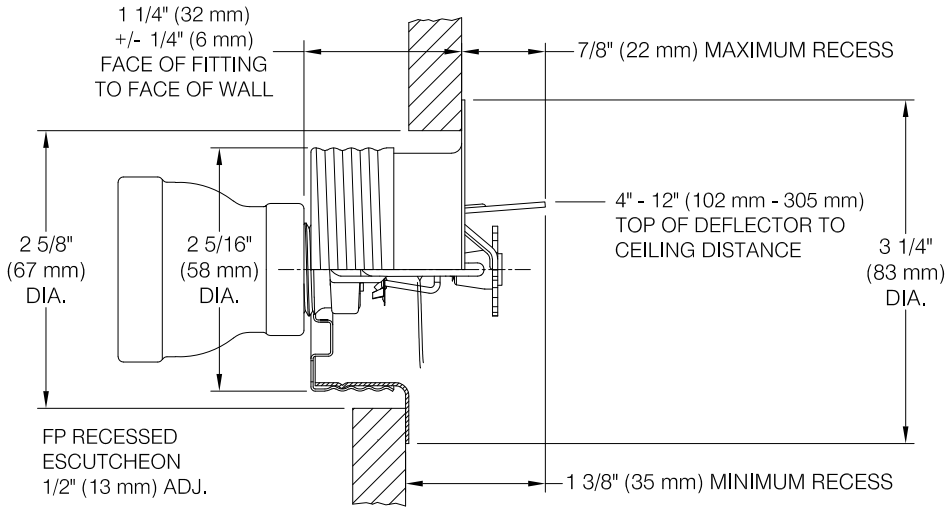
Figure 5



F1 RECESSED ESCUTCHEON INSTALLATION



F2 RECESSED ESCUTCHEON INSTALLATION



FP RECESSED ESCUTCHEON INSTALLATION

Sprinkler, Escutcheon, and Cover Plate Finishes[1] **Table C**

Standard Finishes			Special Application Finishes		
Sprinkler	**F1, F2 , and FP[2] Escutcheons**	**CCP Cover Plate**	**Sprinkler**	**F1, F2 , and FP[2] Escutcheons**	**CCP Cover Plate**
Bronze	Brass	--	Bright Brass	Bright Brass	Bright Brass
Chrome Plated	Chrome Plated	Chrome Plated	Dull Chrome	Dull Chrome	Dull Chrome
White Polyester	White Polyester	White Paint	Black Polyester	Black Polyester	Black Paint
			Custom Color Polyester	Custom Color Polyester	Custom Color Paint

Notes:

[1] Paint or any other coating applied over the factory finish will void all approvals and warranties.
[2] The Model FP escutcheon assembly consists of an unfinished galvanized cup with a finished escutcheon ring.

Wrench

Model W2 (upright, pendent, & HSW)

Model W1 (recessed pendent & HSW, CCP)

Model J (with guard installed)

Maintenance

Reliable Model KFR56 series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers.

Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering.

Sprinkler
- Model (KFR56 Pendent, KFR56 Upright, KFR56 Upright Intermediate, or KFR56 HSW)
- Temperature Rating [165°F (74°C) or 212°F (100°C)]
- Threads (1/2" NPT or ISO 7-1 R3/4)
- Finish (See Table C)

Escutcheon or Coverplate
- Type (None, F1, F2, FP, or CCP)
- Finish (See Table C)

Guards/Water Shields
- See sprinkler information pages in this bulletin

Sprinkler Wrench
- W2 (Pendent, Upright, & HSW)
- W1 (Recessed Pendent & HSW, CCP)
- J (with guard installed)

P/N 9999970483

Reliable®

Model G6-56 Concealed Quick Response Standard Spray Sidewall Sprinkler

cULus Listed

Features

- Nominal 5.6 (80 metric) K-Factor
- 175 psi (12,0 bar) pressure rating
- Convenient push-on/pull-off flat cover plate with 1/4" (6 mm) adjustment
- Cover plate is available in a wide variety of colors and finishes
- Shipped complete with factory installed protective cap

Product Description

The Reliable Model G6-56 is a concealed quick response standard spray sidewall sprinkler that utilizes a push-on/pull-off flat cover plate assembly. The sprinkler can be used in any occupancy where sidewall sprinklers are permitted, and is especially well-suited for use in dormitories, hotels, health care facilities, and offices where aesthetically pleasing sidewall sprinkler protection is needed.

The flat cover plate is attached to the skirt using 135*F (57*C) ordinary temperature classification solder. When the temperature rises, the solder holding the cover plate melts, allowing the release of the plate and exposing the concealed fire sprinkler to the rising temperature.

The Model G5-56 utilizes a quick response solder link that enables the sprinkler to activate five to six times quicker than a standard response sprinkler of the same temperature rating. The sprinkler is listed for a maximum service pressure of 175 psi (12,0 bar), and is shipped with a factory installed protective cap.

Installation

Care must be exercised that orifice size, temperature rating, and sprinkler spacing are in accordance with this bulletin and the latest published standards of the National Fire Protection Association, and approved by the Authority Having Jurisdiction.

Apply a PTFE-based thread sealant or thread sealant tape to the sprinkler threads. Using the Model G6 Wrench (see figure 2), install the sprinkler into the fitting and verify the sprinkler is properly oriented.

Model G6-56 Concealed Sidewall Sprinkler

It is not necessary to remove the factory installed plastic protective cap since it is sized to fit inside the Model G6 wrench. The G6 wrench must be properly orientated on the sprinkler using the key way in the wrench for proper fit. The G6 wrench is provided with a flat surface for use with a bubble level and TOP marking to allow proper orientation of the horizontal sidewall deflector. Final leveling can be performed after a leak proof joint is obtained with a torque between 8 and 18 ft-lbs (11 to 24 N·m). Leave the protective cap in place to protect the sprinkler while the wall is finished.

The protective cap must be removed and the Model G6 listed cover plate installed prior to the sprinkler system being placed in service. Concealed cover plate/cup assemblies are listed only for use with specific sprinklers. The use of any other cover plate with the Model G6-56 Concealed Horizontal Sidewall Sprinkler, the use of the G6 cover plate assembly on any sprinkler with which is it not specifically listed, or alteration of the sprinkler or cover plate will void all guarantees, warranties, listings, and approvals.

Model G6-56 Sprinkler Specifications **Table A**

Sprinkler Model	Orientation	Listing or Approval	Max. Working Pressure psi (bar)	Sprinkler Identification Number (SIN)
G6-56	Horizontal Sidewall, Concealed	cULus	175 (12.0)	RA5035

Model G6-56 Concealed Quick Response Sidewall Standard Spray Sprinkler — SIN RA5035

Technical Specifications
Style: Concealed Horizontal Sidewall
Threads: 1/2" NPT (R1/2)
Nominal K-Factor: 5.6 (80)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Operating Element: Nickel Alloy
Frame Arms: Brass
Sprinkler Body: Bronze
Cap: Bronze
Sealing Washer: Nickel Alloy
Load Screw: Stainless Steel
Push Spring: Stainless Steel
Deflector: Bronze
Yoke: Bronze
Lever Arms: Bronze

Sprinkler Finishes
Bronze (only)

Sensitivity
Quick Response

Cover Plate
Model G6

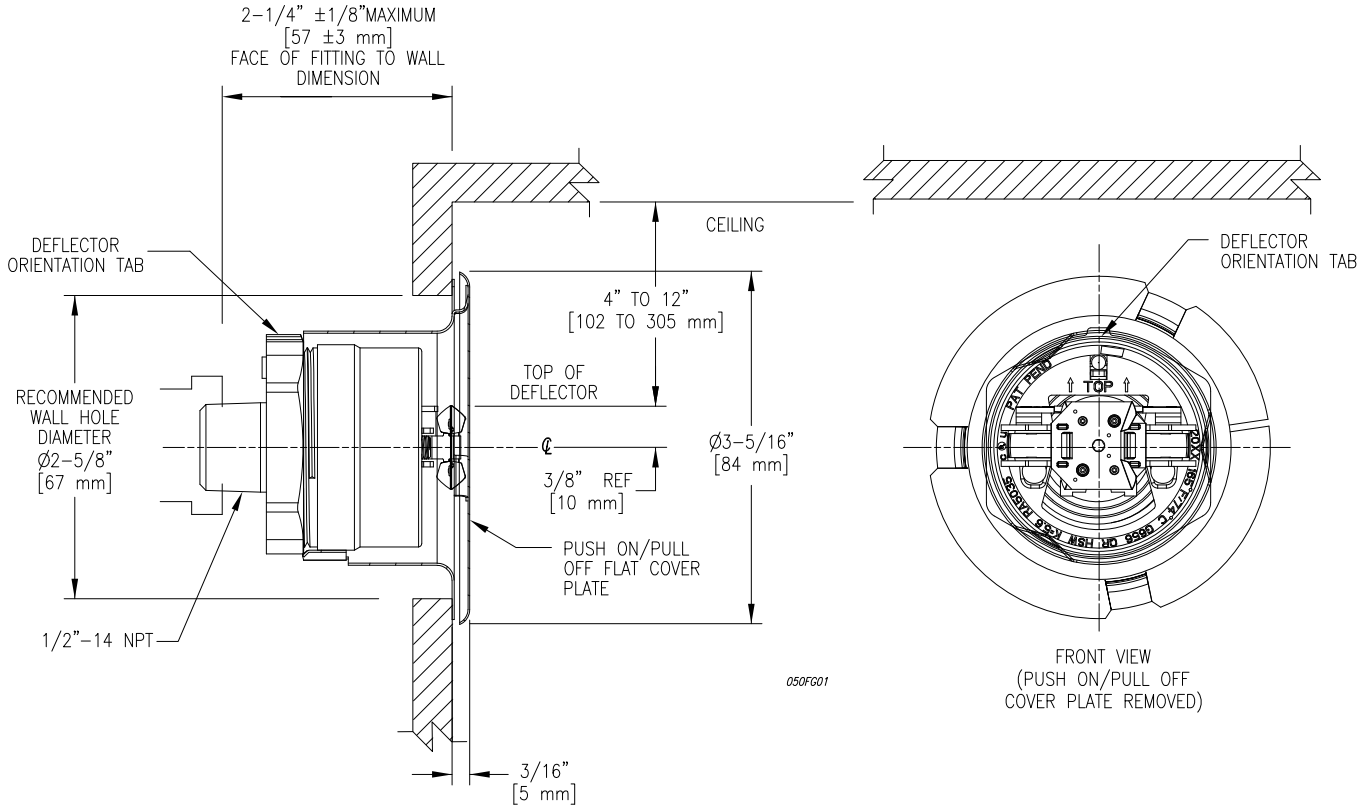
Cover Plate Finishes
(See Table B)

Temperature Ratings
165°F (74°C) (Sprinkler)
135°F (57°C) (Cover Plate)

Sprinkler Wrench
G6 Wrench

Listings and Approvals
cULus Listed

Model G6-56 Concealed Sidewall Sprinkler Components and Dimensions — **Figure 1**



Cover Plate Finishes[1] **Table B**

Standard Finishes	Special Application Finishes
White Paint Chrome	Off-White Paint Black Paint Custom Color Paint – Specify[2] Raw Brass (Lacquered) Bright Brass Finished Bronze Black Plated Satin Chrome

Notes:

1. Paint or any other coating applied over the factory finish will void all approvals and warranties.
2. Custom color paint is semi-gloss unless specified otherwise.

Model G6 Wrench **Figure 2**

Maintenance

Model G6-56 Concealed Sprinklers should be inspected and maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids.

Remove dust by using a soft brush or gentle vacuuming. Replace any sprinkler or cover plate assembly, which has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in their original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify:

- Model G6-56 Concealed Quick Response Sidewall Sprinkler
- Cover Plate Finish (See Table B)

P/N 9999970467

Bulletin 030 Rev. C

Model F1FR56-300 QREC Series 300 psi (20,7 bar) Rated Quick Response Extended Coverage Spray

Model F1FR56-300

Extended Coverage Sprinklers

Sprinkler Types

- Pendent
- Recessed Pendent F1/F2/FP
- Concealed Pendent

Approval Organizations

1. Listed by Underwriters Laboratories, Inc. and Certified for Canada (cULus)

UL Listing Category

Sprinklers, Automatic & Open
Quick Response Sprinkler

UL Guide Number

VNIV

Product Description

Reliable Models F1FR56-300 QREC and F1FR56-300 QREC recessed pendent sprinklers are high pressure rated automatic sprinklers which can handle a maximum service pressure of 300 psi (20,7 bar).

The Reliable Model F1FR56-300 QREC Quick Response Extended Coverage Concealed Sprinkler is an attractive, low profile concealed sprinkler assembly. This sprinkler assembly utilizes a Model F1FR56-300 QREC pendent sprinkler in a Model CCP cup and push-on thread-off cover plate assembly. The cup is securely factory threaded on the sprinkler's inlet end. The assembly is shipped with a protective cap. The sprinkler and cup are easily installed into the sprinkler fitting using the Model RC1 Sprinkler Wrench. The cover plate assembly is attached to the sprinkler cup using a flexible tooth threaded engagement. The cover plate is attached to the skirt using 135°F (57°C) ordinary temperature classification solder.

When the ceiling temperature rises, the solder holding the cover plate melts, allowing the release of this part and thus exposing the Model F1FR56-300 QREC sprinkler inside to the rising ambient temperature.

These Models are quick response sprinklers which utilize a 3.0mm frangible glass bulb. These sprinklers have demonstrated response times in laboratory tests which are five times faster than standard response sprinklers. This quick response enables Model F1FR56-300 QREC sprinklers to apply water to a fire much faster than standard sprinklers of the same temperature rating.

QREC Pendent

Recessed QREC Pendent F1/F2

Concealed QREC Pendent

Recessed QREC Pendent FP

The glass bulb contains an accurately controlled amount of special fluid hermetically sealed inside a precisely manufactured glass capsule. This glass bulb is specially constructed to provide fast thermal response.

At normal temperatures, the glass bulb contains fluid in both the liquid and vapor phases. The vapor phase can be seen as a small bubble. As heat is applied, the liquid expands, forcing the bubble smaller and smaller as the liquid pressure increases. Continued heating forces the liquid to push out against the bulb, causing the glass to shatter, operating the waterway and allowing the deflector to distribute the discharging water.

The temperature rating of the sprinkler is identified by the color of the glass bulb.

Application

The most common applications for Model F1FR56-300 QREC Sprinklers will be in fire protection systems for high rise buildings where a quick response rating is required and the pressure entering the sprinkler system is in excess of 175 psi (12 bar). The use of these sprinklers will provide the opportunity to reduce or eliminate the need for pressure reducing valves.

Model F1FR56-300 Quick Response Extended Coverage Pendent Sprinkler

Deflector: QREC
Installation Wrench: Model D Sprinkler Wrench or Model W2 Sprinkler Wrench
Approval Type: Quick Response Extended Coverage - Light Hazard Occupancy

QREC Pendent

Installation Data:

Nominal Orifice	Thread Size	"K" Factor		Sprinkler Length	Temperature Rating		Sprinkler Identification Numbers (SIN)
		US	Metric		°F	°C	
½" (15mm)	½" NPT (R1/2)	5.6	80	2.25" (57mm)	135 155	57 68	RA3045

Table 1

Coverage Area					
Flow Rate		Pressure K=5.6 (80)		Max. Coverage Area Width x Length	
gpm	L/min	psi	bar	ft. x ft.	m x m
26 33 40	98.4 124.9 151.5	21.6 34.7 51.0	1,5 2,4 3,5	16 x 16 18 x 18 20 x 20	4.9 x 4.9 5.5 x 5.5 6.0 x 6.0(1)

(1) 135°F (57°C) only.

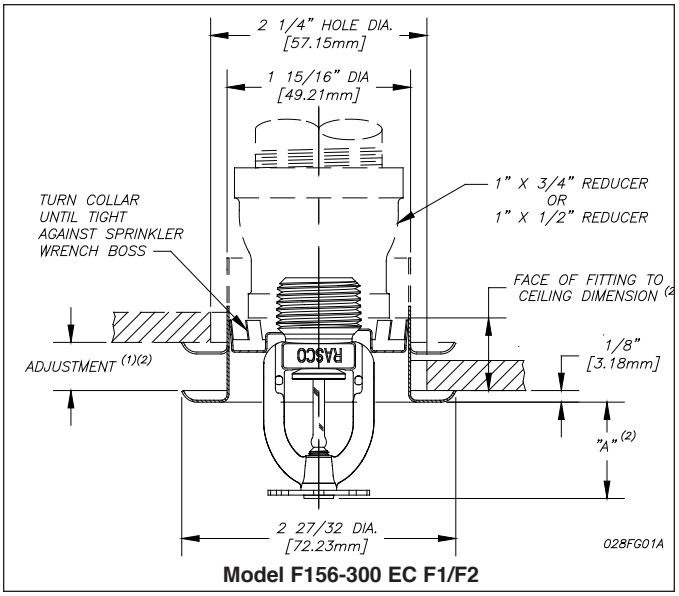
Model F1FR56-300 Quick Response Extended Coverage Recessed Pendent Sprinkler

Deflector: QREC
Installation Wrench: Model GFR2 Sprinkler Wrench
Approval Type: Quick Response Extended Coverage - Light Hazard Occupancy

Installation Data(1):

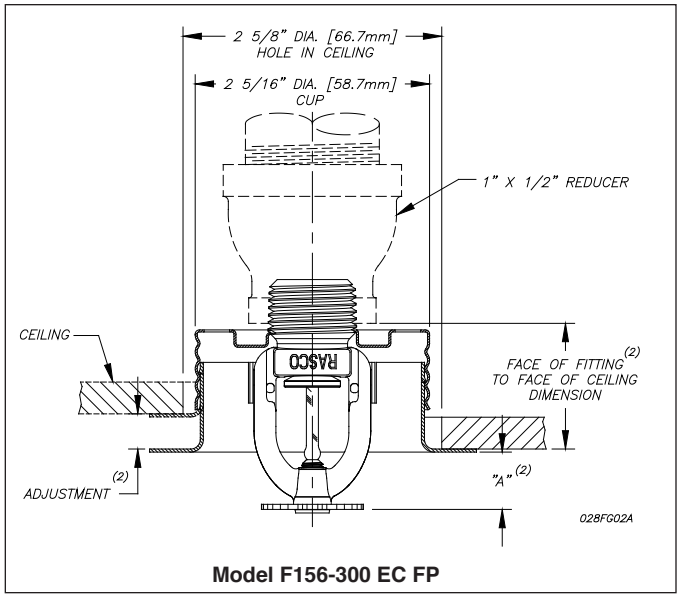
Nominal Orifice	Thread Size	"K" Factor		Sprinkler Length	Temperature Rating		Sprinkler Identification Numbers (SIN)
		US	Metric		°F	°C	
½" (15mm)	½" NPT (R1/2)	5.6	80	2.25" (57mm)	135 155	57 68	R3045

(1) For Coverage Area refer to Table 1.



Model F156-300 EC F1/F2

Fig. 1



Model F156-300 EC FP

Fig. 2

(1) When installed directly into a tee, the escutcheon adjustment will be reduced.
(2) Refer to escutcheon data table for dimensions.

Model F1FR56-300 Quick Response Extended Coverage Concealed Pendent Sprinkler

Installation Wrench: Model RC1 Sprinkler Wrench
Approval Type: Quick Response Extended Coverage - Light Hazard Occupancy

Technical Data:

Nominal Orifice	Thread Size	"K" Factor		Sprinkler Identification Number (SIN)
		US	Metric	
½" (15mm)	½" (R1/2)	5.6	80	RA3045

Thread Size	Model	Temp. Rating		Max. Ambient Temp.	Bulb Color
		Sprinkler	Cover		
½" NPT (R1/2)	F1FR-300 QREC	135°F 57°C	135°F 57°C	100°F 38°C	Orange
½" NPT (R1/2)	F1FR-300 QREC	155°F 68°C	135°C 57°C	100°F 38°C	Red

Coverage Area		
Flow Rate gpm (L/m)	Pressure psi (bar) K=5.6 (Metric 80)	Max. Coverage Area Width x Length ft. x ft. (m x m)
21.2 (80.3)	14.2 (0,98)	14 x 14 (4.3 x 4.3)
26 (98.4)	21.6 (1,5)	16 x 16 (4.9 x 4.9)
33 (124.9)	34.7 (2,4)	18 x 18 (5.5 x 5.5)
40 (151.5)	51.0 (3,5)	20 x 20[(1)] (6.0 x 6.0)[(1)]

[(1)] 135°F (57°C) Only

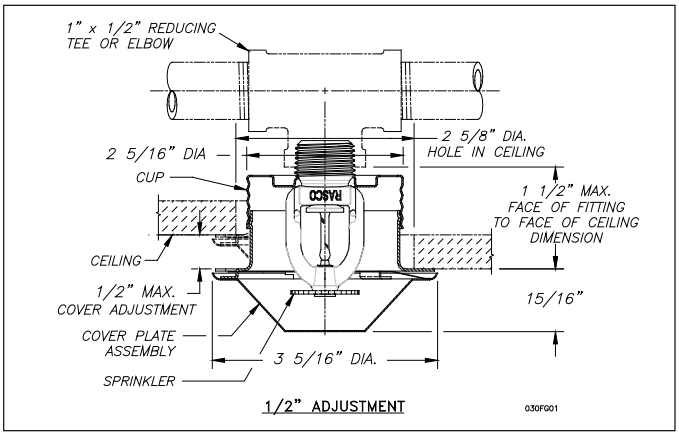


Fig. 3

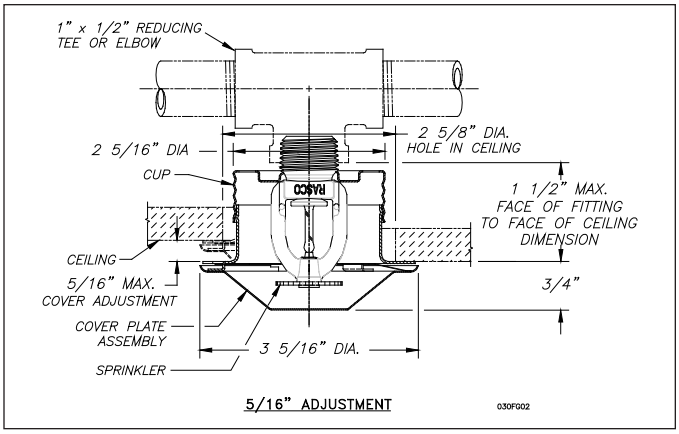


Fig. 4

Installation Aid:
A protective cap is included for use during installation.

Installation

Quick response sprinklers are intended for installation as specified in NFPA 13. Quick response sprinklers and standard response sprinklers should not be intermixed.

The Model F1FR56-300 QREC Pendent and Recessed Sprinklers are to be installed as illustrated. The Model F1, F2, and FP escutcheons illustrated are the only recessed escutcheons to be used with the these sprinklers. The use of any other recessed escutcheon will void all approvals and negate all warranties.

When installing Model F1FR56-300 QREC Pendent Sprinklers, use the Model D Sprinkler Wrench or Model W2 Sprinkler Wrench. When installing F1FR56-300 QREC Recessed Pendent Sprinkler, use the Model GFR2 Sprinkler Wrench. Any other type of wrench may damage these sprinklers.

Model F1FR56-300 QREC Concealed Sprinklers use 135°F (57°C) or 155°F (68°C) Model F1FR56-300 QREC Pendent Sprinklers with a threaded Model CCP cup which is factory attached to the sprinkler. The assembly is completed by the installation of the attractive, low profile, 135°F (57°C) rated cover plate assembly. The cover plate and sprinkler cup are joined using a flexible tooth threaded engagement. A choice of two cover plate assemblies provides either ½" (13mm) or 5/16" (8mm) of cover adjustment.

Do not install these sprinklers in ceilings which have positive pressure in the space above.

After a $2^5/_8$" (67mm) inch diameter hole is cut in the ceiling, the sprinkler is easily installed with the Model RC1 Wrench. When installing a sprinkler, the protective cap is removed and the wrench is positioned into the sprinkler/cup assembly until the two wrench faces engage the wrenching flats on the Model F1FR56 QREC Sprinkler. The sprinkler is then tightened into the pipe fitting. When inserting or removing the wrench from the sprinkler/cup assembly, care should be taken to prevent damage to the sprinkler. DO NOT WRENCH ON ANY OTHER PART OF THE SPRINKLER. The cover plate assembly is then pressed into the cup. Final adjustment is made by turning the cover plate until the skirt flange makes full contact with he ceiling surface. Cover plate removal requires turning in the counter clockwise direction.

After installation, inspect all sprinklers to ensure that there is a gap between the cover plate and ceiling and that the four cup slots are open and free from any air flow

impediment to the space above.

Concealed cover plate/cup assemblies are listed only for use with specific sprinklers. The use of any other concealed cover plate/cup assembly with the Model F1FR56-300 QREC Pendent Sprinkler or the use of the Model CCP concealed cover plate assembly on any sprinkler with which it is not specifically listed may prevent good fire protection and will void all guarantees, warranties, listings and approvals.

Glass bulb sprinklers have orange bulb protectors to minimize bulb damage during shipping, handling and installation. REMOVE THIS PROTECTION AT THE TIME THE SPRINKLER SYSTEM IS PLACED IN SERVICE FOR FIRE PROTECTION. Removal of the protectors before this time may leave the bulb vulnerable to damage. RASCO wrenches are designed to install sprinklers when covers are in place. REMOVE PROTECTORS BY UNDOING THE CLASP BY HAND. DO NOT USE TOOLS TO REMOVE THE PROTECTORS.

Maintenance

Model F1FR56-300 QREC Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Remove dust by using a soft brush or gentle vacuuming. Remove any sprinkler that has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damage or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

Escutcheon Data:

Escutcheon Model	Adjustment	"A" Dimension	Face of Fitting to Ceiling or Wall Dimension
F1	Max Recess Min Recess	1½" (38.1mm) ¾" (19.1mm)	3/16" - 15/16" (5mm - 24mm)
F2	Max Recess Min Recess	1 ½" (38.1mm) 1" (24mm)	3/16" - 11/16" (5mm - 17mm)
FP Push-on/ Thread-off	Max Recessed Min Recessed	7/16" (11mm) 15/16 (24mm)	1½" (38.1mm) 1" (25.4mm)

Maximum Working Pressure

300 psi (20.7 bar)
100% Factory tested hydrostatically to 600 psi (41.4 bar)

Finishes (1)

Standard Finishes	
Sprinkler	**Escutcheon**
Bronze Chrome Plated White Polyester Coated	Brass Chrome Plated White Painted
Special Application Finishes	
Sprinkler	**Escutcheon**
Bright Brass Black Plated Black Paint Off White Satin Chrome	Bright Brass Black Plating Black Paint Off White Satin Chrome

Cover Plate Finishes(1)

Standard Finishes
Chrome White
Special Application Finishes
Bright Brass Black Plating Black Paint Off White

(1) Other colors and finishes are available on special order. Consult factory for details. Coverplate custom paint is semi-gloss, unless specified otherwise.

Note: Paint or any other coating applied over the factory finish will void approvals and waranties.

Ordering Information

Specify:

1. Sprinkler Model
2. Sprinkler Type
3. Orifice Size
4. Deflector Type
5. Temperature Rating
6. Sprinkler Finish
7. Escutcheon Type
8. Escutcheon Finish (where applicable)
9. Cover Plate Model
10. Cover Plate Thread Size
11. Cover Plate Temperature Rating
12. Cover Plate Adjustment
13. Cover Plate Finish

Note: When F1FR56-300 QREC Recessed sprinklers are ordered, the sprinklers, escutcheons and coverplates are packaged separately.

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable. Products manufactured and distributed by Reliable have been protecting life and property for over 90 years.

Manufactured by
Reliable®

The Reliable Automatic Sprinkler Co., Inc.
(800) 431-1588 Sales Offices
(800) 848-6051 Sales Fax
(914) 829-2042 Corporate Offices
www.reliablesprinkler.com Internet Address

Recycled Paper

Revision lines indicate updated or new data.

EG. Printed in U.S.A. 03/17 P/N 9999970390

Bulletin 148 Rev. H

Model F1FR QREC Series K8.0 (115 metric) Quick Response Extended Coverage Sprinklers

A complete line of UL Listed and FM Approved quick response extended coverage sprinklers for light hazard applications.

Horizontal Sidewall Sprinklers are approved for installation 4" - 12" (102mm - 305mm) below the ceiling.

Model F1FR QREC Sprinkler Types

Extended Coverage Pendent
Extended Coverage Horizontal Sidewall
- EC-9 Deflector

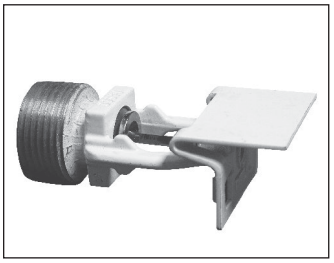
Model F1FR QREC Recessed Sprinkler Types

Recessed Extended Coverage Pendent
Recessed Extended Coverage Horizontal Sidewall:
- EC-9 Deflector

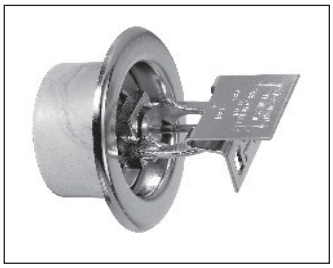
For Model F1FR QREC ½" K 5.6 (80) Sprinkler Types refer to Bulletin 028.

Extended Coverage Pendent

Recessed Extended Coverage Pendent



Extended Coverage Horizontal Sidewall EC-9



Recessed Extended Coverage Horizontal Sidewall EC-9

Approval Organizations

1. Underwriters' Laboratories, Inc. (UL)
2. Underwriters Laboratories of Canada (ULC)
3. Factory Mutual Approvals (FM)
4. NYC MEA 258-93-E

UL Listing Category

Sprinklers, Automatic & Open
Quick Response Extended Coverage Sprinkler

UL Guide Number

VNIV

Note: Consult appropriate FM Installation Standards regarding limitations of room size, ceiling height and minimum wall fire resistance rating.

Product Description

Reliable Models F1FR QREC and F1FR QREC Recessed Sprinklers are quick response sprinklers which combine the durability for a standard sprinkler with the attractive low profile of a decorative sprinkler.

The Models F1FR QREC and F1FR QREC Recessed Automatic Sprinklers utilize a 3.0mm frangible glass bulb. These sprinklers have demonstrated response times in laboratory tests which are five times faster than standard response sprinklers. This quick response enables these sprinklers to apply water to a fire faster than standard response sprinklers of the same temperature rating.

The glass bulb consists of an accurately controlled amount of special fluid hermetically sealed inside a precisely manufactured glass capsule. This glass bulb is specially constructed to provide fast thermal response. The balance of parts are made of brass, copper and beryllium nickel.

The temperature rating of the sprinkler is identified by the color of the glass bulb.

Application

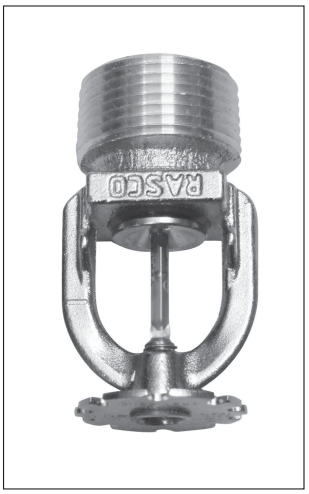
Quick response sprinklers are used in fixed fire protection systems: Wet, Dry, Deluge or Preaction. Care must be exercised that the orifice size, temperature rating, deflector style and sprinkler type are in accordance with the latest published standards of the National Fire Protection Association or the approving authority having jurisdiction. Quick response sprinklers are intended for installation as specified in NFPA 13.

Model F1FR QREC Pendent Sprinkler

Deflector: EC

Installation Wrench: Model D Sprinkler Wrench or Model W2 Sprinkler Wrench

Approval Type: Quick Response Extended Coverage-Light Hazard Occupancy



Installation Data:

Nominal Orifice	Thread Size	Nominal K- Factor		Sprinkler Length	Temperature Rating	Approval Organizations	Sprinkler Identification Number (SIN)
		US	Metric				
17/32" (20mm)	¾" NPT (R¾)	8.0	115	2.2" (56.1mm)	135°F (57°C) 155°F (68°C)	1,2,3,4	R4842

Model F1FR QREC Recessed Pendent Sprinkler

Deflector: EC

Installation Wrench: Model GFR2 Sprinkler Wrench

Approval Type: Quick Response Extended Coverage-Light Hazard Occupancy

Installation Data:

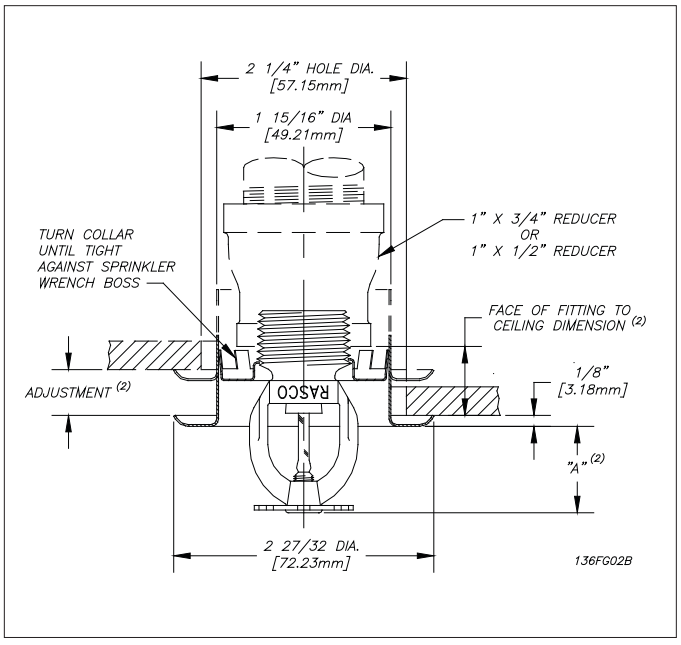
Nominal Orifice	Thread Size	Nominal K-Factor		Sprinkler Length	Temperature Rating	Approval[1] Organizations	Sprinkler Identification Number (SIN)
		US	Metric				
17/32" (20mm)	¾" NPT (R¾)	8.0	115	2.2" (56.1mm)	135°F (57°C) 155°F (68°C)	1, 2, 3, 4	R4842

[1] Refer to escutcheon data table for dimensions.

Model F1FR QREC Pendent and Recessed Pendent

Required Minimum Flow/Pressure		
Flow Rate gpm (L/min)	**Pressure psi (bar)**	**Maximum Coverage Area Width x Length ft. x ft. (m x m)**
26 (98.4)	10.6 (0,7)	16 x 16 (4.9 x 4.9)
33 (125.0)	17.0 (1,2)	18 x 18 (5.5 x 5.5)
40 (151.4)	25.0 (1,7)	20 x 20 (6.0 x 6.0) [2]

[2] UL/ULC Listed for both Pendent and Recessed Pendent at 135°F (57°C) only.



Model F1FR QREC Horizontal Sidewall Sprinkler

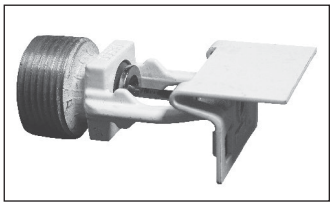
Deflector: EC-9

Installation Wrench: Model D Sprinkler Wrench of Model W2 Sprinkler Wrench

Approval Type: Quick Response Extended Coverage-Light Hazard Occupancy

Installation Data

Nominal Orifice	Thread Size	Nominal K-Factor		Sprinkler Length	Approval[2] Organizations	Temperature Rating	Sprinkler Identification Number (SIN)
		US	Metric				
17/32" (20mm)	¾" NPT (R¾)	8.0	115	2.85 (72.4mm)	1,2,3,4	135°F (57°C) 155°F (68°C) 175°F (79°C)	R4862



Model F1FR QREC Recessed Horizontal Sidewall Sprinkler

Deflector: EC-9

Installation Wrench: Model GFR2 Sprinkler Wrench

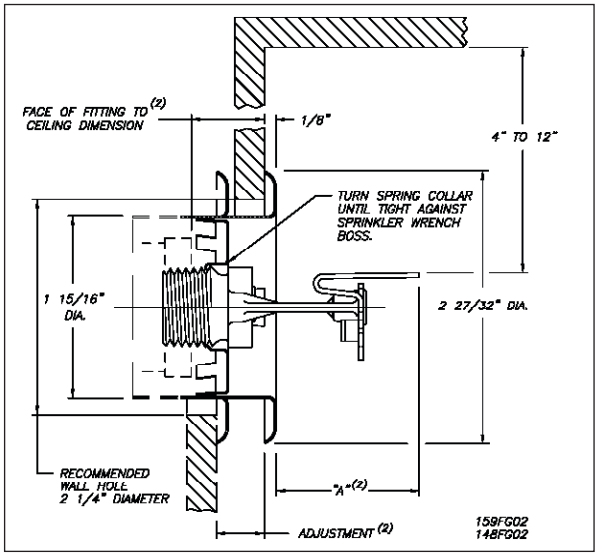
Approval Type: Quick Response Extended Coverage-Light Hazard Occupancy

Model F1FR QREC Horizontal Sidewall and Recessed Horizontal Sidewall

Required Minimum Flow/Pressure								
Flow Rate gpm (L/min)		Pressure psi (bar)		Maximum Coverage Area Width x Length ft. x ft. (m x m)	Temperature Rating[1]	Approval[2] Organizations		Deflector to Ceiling Dimension Min. - Max. Inches (mm)
UL	FM	UL	FM			F1	F2	
26 (98.4)	-	10.6 (0,7)	-	16 x 16 (4.9 x 4.9)	135°F (57°C)	1, 2, 4	1, 2, 3, 4	6 - 12 (153 - 305)
29 (109.8)	32 (121.1)	13.1 (0,9)	16.0 (1,1)	16 x 16 (4.9 x 4.9)				4 - 12 (102 - 305)
29 (109.8)	36 (136.3)	13.1 (0,9)	20.2 (1,4)	16 x 18 (4.9 x 5.5)	155°F (68°C)			4 - 12 (102 - 305)
32 (121.1)	40 (151.4)	16.0 (1,1)	25.0 (1,7)	16 x 20 (4.9 x 6.0)				4 - 12 (102 - 305)
36 (136.3)	44 (166.6)	20.2 (1,4)	30.2 (2,1)	16 x 22 (4.9 x 6.7)	175°F (79°C)			4 - 12 (102 - 305)
39 (147.6)	48 (181.7)	23.8 (1,6)	36.0 (2,5)	16 x 24 (4.9 x 7.3)				4 - 12 (102 - 305)
33 (124.9)		17.0 (1,2)		18 x 18 (5.5 x 5.5)	135°F (57°C)	1, 2	1, 2	4 - 12 (102 -305)
39 (147.6)		23.8 (1,6)		14 x 26 (4.3 x 7.9)	135°F (57°C)			4 - 6 (102 - 153)
40 (151.4)		25.0 (1,7)		18 x 22 (5.5 x 6.7)	135°F (57°C)			4 - 12 (102 - 305)
46 (174.1)		33.1 (2,25)		14 x 26 (4.3 x 7.9)	135°F (57°C)			6 - 12 (153 - 305)
33 (124.9)		17.0 (1,2)		18 x 18 (5.5 x 5.5)	155°F (68°C)			4 -12 (102 - 305)
40 (151.4)		25.0 (1,7)		18 x 22 (5.5 x 6.7)	155°F (68°C)			4 - 12 (102 - 305)
46 (174.1)		33.1 (2,25)		14 x 26 (4.3 x 7.9)	155°F (68°C)			6 - 12 (153 - 305)

[1] FM Approval of recessed sprinkler - 135°F (57°C) and 155°F (68°C) only.

[2] Refer to escutcheon data table for dimensions.



Installation

Quick response sprinkler are intended for installation as specified in NFPA 13. Quick response sprinklers and standard response sprinklers should not be intermixed.

The Model F1FR QREC Recessed Sprinklers are to be installed as shown. The Model F1 or F2 Escutcheons illustrated are the only recessed escutcheons to be used with the Model F1FR QREC Sprinklers. The use of any other recessed escutcheon will void all approvals and negate all warranties.

When installing Model F1FR QREC Sprinklers, use the Model D Sprinkler Wrench or Model W2 Sprinkler Wrench. When installing Model F1FR QREC Recessed Pendent or Recessed Sidewall Sprinklers, use the Model GFR1 Sprinkler Wrench. Any other type of wrench may damage these sprinklers.

Glass bulb sprinklers have orange bulb protectors to minimize bulb damage during shipping, handling and installation. REMOVE THIS PROTECTION AT THE TIME THE SPRINKLER SYSTEM IS PLACED IN SERVICE FOR FIRE PROTECTION. Removal of the protectors before this time may leave the bulb vulnerable to damage. RASCO wrenches are designed to install sprinklers when covers are in place. REMOVE PROTECTORS BY UNDOING THE CLASP BY HAND. DO NOT USE TOOLS TO REMOVE THE PROTECTORS.

Maintenance

The Models F1FR QREC and F1FR QREC Recessed Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Remove dust by gentle vacuuming. Replace any sprinkler which has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

Temperature Ratings

Classification	Sprinkler Rating		Maximum Ambient Temp.		Bulb Color
	°F	°C	°F	°C	
Ordinary	135	57	100	38	Orange
Ordinary	155	68	100	38	Red
Intermediate	175	79	150	66	Yellow

Maximum Working Pressure

175 psi (12 bar)

SIN R4842 & R4862 cULus listed for 250 psi (17 bar)

100% Factory tested hydrostatically to 500 psi (34.5 bar)

Sprinkler Types

Extended Coverage Pendent

Extended Coverage Sidewall

- EC-9 HSW Deflector

Recessed Extended Coverage Pendent

Recessed Extended Coverage Sidewall

- EC-9 HSW Deflector

Finishes[1]

Standard Finishes[1]	
Sprinkler	**Escutcheon**
Bronze	Brass
Chrome	Chrome
White & Black Polyester[3]	White
Special Application Finishes	
Sprinkler[2]	**Escutcheon**
Electroless Nickel PTFE[3]	Electroless Nickel PTFE
Bright Brass	Bright Brass
Black Plating	Black Plating
Black Paint	Black Paint
Off White Satin	Off White
Chrome	Chrome Dull

[1] Other colors and finishes are available on special order. Consult factory for details.

[2] FM Approval limited to bronze, bright and satin chrome plated, and polyester coated only.

[3] cULus Listed Corrosion Resistant Sprinkler

Escutcheon Data

Escutcheon Model	Adjustment	"A" Dimension	Face of Fitting to Ceiling or Wall Dimension
F1	3/4" (19mm)	3/4" (19mm)[1] 1 3/8" (35mm)[2]	3/16" (5mm) - 15/16" (24mm)
F2	1/2" (13mm)	1" (25mm)[1] 1 9/16" (40mm)[2]	3/16" (5mm) - 11/16" (18mm)

[1] EC Pendent

[2] EC HSW

Ordering Information

Specify:

1. Sprinkler Model: F1FR QREC
2. Sprinkler Type
3. Temperature Rating
4. Sprinkler Finish
5. Thread Type: [¾" NPT] [ISO 7-1R¾]
6. Escutcheon Type
7. Escutcheon Finish (where applicable)

Note: When Model F1FR Recessed sprinklers are ordered, the sprinklers and escutcheons are packaged separately.

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Products manufactured and distributed by Reliable have been protecting life and property for almost 100 years.

Manufactured by

Reliable®

Reliable Automatic Sprinkler Co., Inc.

(800) 431-1588 Sales Offices

(800) 848-6051 Sales Fax

(914) 829-2042 Corporate Offices

www.reliablesprinkler.com Internet Address

Recycled Paper

Revision lines indicate updated or new data.

EG. Printed in U.S.A. 03/17 P/N 9999970142

Reliable®

Model F1FR QREC CCP Concealed Quick Response Extended Coverage Sprinkler

Bulletin 151 September 2020

Concealed Quick Response Sprinkler Coverage to 20' x 20' (6.0 m x 6.0 m)

Features

1. Quick response performance.
2. Push on, thread off, sturdy convenient cover plate.
3. Factory assembled sprinkler and cup, shipped complete with protective cap.
4. Sprinkler assembly and cover plate separately packaged.
6. Rugged damage resistant assembly. No exposed thermal element.
7. Utilizes the Model F1FR QREC Pendent Sprinkler.
8. Aesthetic ceiling profile.
9. Standard finishes in white painted or chrome plated. Other color-painted and specialty finishes available.

For Model F1FR QREC CCP ½" K 5.6 (80) Sprinkler Types refer to Bulletin 028 for technical specifications and approvals.

Product Description

Model F1FR QREC Quick Response Extended Coverage Concealed Sprinkler is an attractive, low profile concealed sprinkler assembly. This sprinkler assembly utilizes a Model F1FR QREC pendent sprinkler in a Model CCP cup and push-on thread-off cover plate assembly. The cup is securely factory threaded on the sprinkler's inlet end. The assembly is shipped with a protective cap. The sprinkler and cup are easily installed into the sprinkler fitting using the Model GFR2 Sprinkler Wrench. The cover plate assembly is attached to the sprinkler cup using a flexible tooth threaded engagement. The cover plate is attached to the skirt using 135°F (57°C) ordinary temperature classification solder.

When the ceiling temperature rises, the solder holding the

cover plate melts, allowing the release of this part and thus exposing the Model F1FR QREC sprinkler inside to the rising ambient temperature. The Temperature rating of the sprinkler identified by the color of the glass bulb.

Model F1FR QREC automatic sprinkler utilizes a 3.0 mm frangible glass bulb. This sprinkler has demonstrated response times in laboratory tests which are five times faster than standard response sprinklers. This quick response enables the Model F1FR QREC sprinkler to apply water to a fire faster than standard sprinklers of the same temperature rating.

Approval Type:

Quick Response Extended Coverage — Light Hazard

Technical Data:

Nominal Orifice	Thread Size	K Factor		Approval Organizations	Sprinkler Ident. Number (SIN)
		US	Metric		
17/32" (20mm)	¾" (R¾)	8.0	115.3	cULus	R4842

Thread Size	Model	Temp. Rating		Max. Ceiling Temp.	Bulb Color
		Sprinkler	Cover		
¾" NPT (R¾)	F1FR QREC	135°F 57°C	135°F 57°C	100°F 38°C	Orange
¾" NPT (R¾)	F1FR QREC	155°F 68°C	135°F 57°C	100°F 38°C	Red

Coverage Area		
Flow Rate gpm (L/m)	Pressure psi (bar) K=8.0 (Metric 115.3)	Max. Enclosure Area Width x Length ft. x ft. (m x m)
26 (98.4)	10.6 (0,7)	16 x 16 (4.9 x 4.9)
33 (125.0)	17.0 (1,2)	18 x 18 (5.5 x 5.5)
40 (151.4)	25.0 (1,7)	20 x 20[1] (6.0 x 6.0)[1]

[1] 135°F (57°C) Only

Note: 1 bar = 100 kPa

Application and Installation

Model F1FR QREC Concealed Sprinklers use 135°F (57°C) or 155°F (68°C) Model F1FR QREC Pendent Sprinklers with a threaded Model CCP cup which is factory attached to the sprinkler. The assembly is completed by the installation of the attractive, low profile, 135°F (57°C) rated cover plate assembly. The cover plate and sprinkler cup are joined using a flexible tooth threaded engagement.

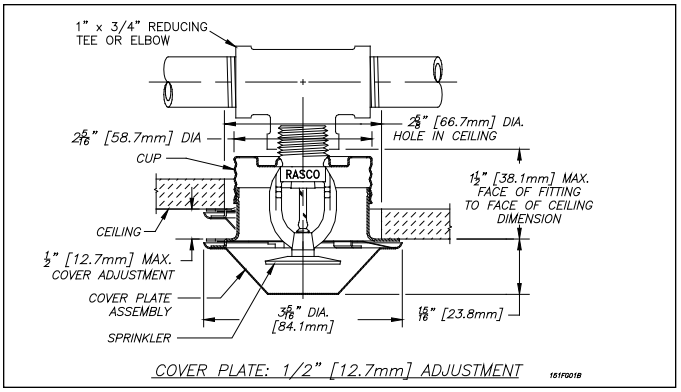
Do not install these sprinklers in ceilings which have positive pressure in the space above.

The sprinkler cup is factory attached to the Model F1FR QREC Sprinkler. A PTFE based thread sealant should be applied to the sprinkler threads only.

After a 2⅝ inch (67mm) diameter hole is cut in the ceiling, the sprinkler is easily installed with the Model GFR2 Wrench. When installing a sprinkler, the protective cap is removed and the wrench is positioned into the sprinkler/cup assembly until the two wrench faces engage the wrenching flats on the Model F1FR QREC Sprinkler. The sprinkler is then tightened into the pipe fitting. When inserting or removing the wrench from the sprinkler/cup assembly, care should be taken to prevent damage to the sprinkler. DO NOT WRENCH ON ANY OTHER PART OF THE SPRINKLER. The cover plate assembly is then pressed into the cup. Final adjustment is made by turning the cover plate until the skirt flange makes full contact with the ceiling surface. Cover plate removal requires turning in the counter clockwise direction.

After installation, inspect all sprinklers to ensure that there is a gap between the cover plate and ceiling and that the four cup slots are open and free from any air flow impediment to the space above.

Concealed cover plate/cup assemblies are listed only for use with specific sprinklers. The use of any other concealed cover plate/cup assembly with the Model F1FR QREC Pendent Sprinkler or the use of the Model CCP concealed cover plate assembly on any sprinkler with which it is not specifically listed may prevent good fire protection and will void all guarantees, warranties, listings and approvals.



Maintenance

Model F1FR QREC Concealed Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Remove dust by using a soft brush or gentle vacuuming. Remove any sprinkler cover plate assembly which has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

Approvals

cULus (Sprinklers, Automatic and Open. Quick Response Extended Coverage Sprinklers)
NYC MEA 258-93-E

Ordering Information

Specify:Sprinkler Model:

1. F1FR QREC Pendent
   3/4" NPT or ISO 7-R3/4 threads
2. Sprinkler Temp. Rating[1]:
   135°F (57°C) or
   155°F (68°C).
3. Cover plate Model: CCP
4. Cover plate temp. rating:
   135°F (57°C).
5. Cover plate finish:

[1] 135°F (57°C) required for 20' x 20' (6.0m x 6.0m) coverage area

Installation Wrench

Model GFR2 Sprinkler Wrench

Installation Aid

A protective cap is included for use during installation.

Cover Plate Finishes[1]

Standard Finishes
Chrome
White
Special Application Finishes
Bright Brass
Black Plating
Black Paint
Off White
Satin Chrome

[1] Other finishes and colors are available on special order. Consult factory for details.

Note: Paint or any other coatings applied over the factory finish will void all approvals and warranties.
Important: The F1FR QREC Sprinkler with the Model CCP cover plate is not an FM Approved combination.

Manufactured by

Reliable®

The Reliable Automatic Sprinkler Co., Inc.
(800) 431-1588 Sales Offices
(800) 848-6051 Sales Fax
(914) 829-2042 Corporate Offices
www.reliablesprinkler.com Internet Address

Recycled Paper

Revision lines indicate updated or new data.

EG. Printed in U.S.A. 09/20 P/N 9999970148

Reliable®

Model HL22 ESFR Pendent Sprinkler

175 psi (12 bar) rated

Features

- cULus, VdS, and LPCB listed as an ESFR sprinkler
- FM Approved as a quick-response, storage and non-storage sprinkler
- Fusible link operating element

Product Description

The Reliable Model HL22 is an Early Suppression Fast Response (ESFR) Sprinkler with a nominal K-factor of 22.4 (320 metric). The sprinklers use a levered fusible alloy solder link in either a 165°F (74°C) or a 212°F (100°C) temperature rating. These sprinklers are designed to respond quickly to growing fires and will deliver a heavy water discharge to "suppress" rather than "control" fires.

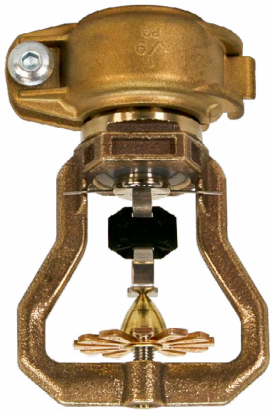
FM Approvals classifies the Model HL22 as a quick-response sprinkler, storage and non-storage, when used in accordance with FM Global Property Loss Prevention Data Sheets.

In addition to the design criteria provided in NFPA 13, the Model HL22 also has a Specific Application UL listing for 45' storage of Class I - IV and cartoned unexpanded Group A plastic in a 48' building (reference Table C for full details).

The HL22 sprinklers are available with 1" NPT or ISO7 R-1 threads, and also with the Victaulic® IGS™ Style V9 Sprinkler Coupling*.

***Note:** Victaulic® and IGS™ are trademarks of Victaulic Company.

Model HL22 ESFR Sprinkler



Model HL22 Sprinkler w/ Victaulic® IGS™ Style V9 Sprinkler Coupling

Model HL22 ESFR Pendent Sprinkler — **Table A**

Model	Nominal K-factor gpm/psi$^{1/2}$ (L/min/bar$^{1/2}$)	Approvals	Sprinkler Identificaiton Number (SIN)
HL22	22.4 (320)	cULus, FM, LPCB, VdS	RA1011

Model HL22 ESFR Sprinkler — SIN RA1011

Technical Specifications

Style: Pendent

Connection: 1” NPT or ISO7 R-1 threads, IGS™ Style V9 Sprinkler Coupling
Nominal K-Factor: 22.4 (320)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: Beryllium Nickel Solder Link
Sprinkler Frame: Brass Casting
Button: Copper Alloy
Sealing Assembly: Nickel with PTFE
Load Screw: Bronze
Deflector: Bronze
Levers: Stainless Steel
Ejection Spring: Stainless Steel

Sprinkler Finishes

Standard (Brass Only)

Sensitivity

Fast-Response (cULus)
Quick-Response (FM)

Temperature Ratings

Ordinary: 165°F (74°C)
Intermediate: 212°F (100°C)

Guards and Shields

K22 Guard (In-rack ONLY)
S-5 Shield (In-rack ONLY)

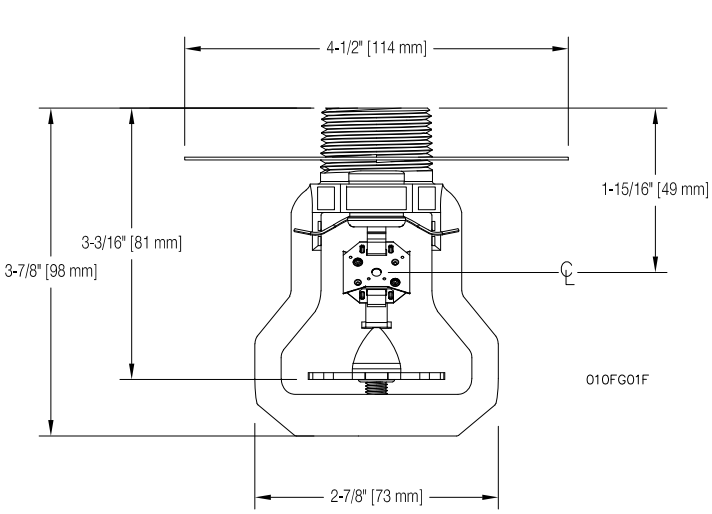
Sprinkler Wrench

Model W5

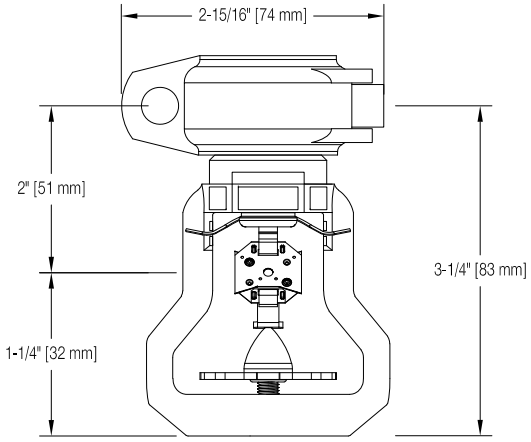
Listings and Approvals

cULus
FM Approved
LPCB
VdS

Model HL22 Sprinkler Components and Dimensions — Figure 1

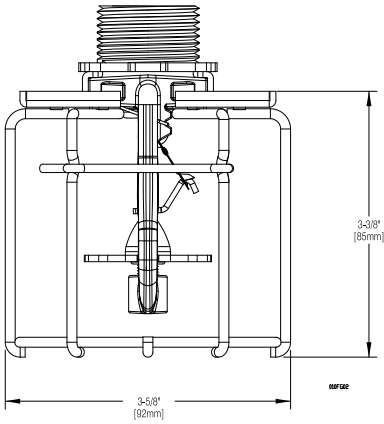


Threaded
(Shown with optional S-5 Water Shield, ordered separately; available for threaded sprinklers only)



IGS™ Grooved with Style V9 Coupling

Model HL22 ESFR Sprinkler with Model 22 Guard — Figure 2



Model HL22 ESFR Commodity Selection and Design Criteria Overview **Table B**

Storage Type	NFPA	FM GLOBAL
Sprinkler Type	ESFR	Storage
Response Type	ESFR	Quick Response
System Type	Wet	Wet
Temperature Rating °F (°C)	165 (74), 212 (100)	165 (74), 212 (100)
Roof Construction	See NFPA 13	See FM Global 2-0
Ceiling Slope	See NFPA 13	See FM Global 2-0
Maximum Coverage Area	See NFPA 13	See FM Global 2-0
Minimum Coverage Area	See NFPA 13	See FM Global 2-0
Maximum Spacing	See NFPA 13	See FM Global 2-0
Minimum Spacing	See NFPA 13	See FM Global 2-0
Minimum Clearance to Commodity	See NFPA 13	See FM Global 2-0
Sprinkler Distance to Ceiling	See NFPA 13	See FM Global 2-0
Open Frame, Single, Double, Multiple Row, or Portable Rack Storage of Class I - IV Commodity and Group A Plastic	See NFPA 13	See FM 2-0 & 8-9
Solid Pile or Palletized Storage of Class I - IV Commodity and Group A Plastic	See NFPA 13	See FM 2-0 & 8-9
Idle Pallet Storage	See NFPA 13	See FM 2-0, 8-9 & 8-24
Rubber Tire Storage	See NFPA 13	See FM 2-0 & 8-3
Rolled Paper Storage	See NFPA 13	See FM 8-21
Flammable Liquid Storage	See NFPA 30	See FM 7-29
Aerosol Storage	See NFPA 30B	See FM 7-31
Auto Components in Portable Racks	N/A	N/A

Model HL22 Commodity Selection and Design Criteria Overview Specific Application Listing (UL) **Table C**

Description	UL Specific Application Criteria
Sprinkler Type	ESFR
Temperature Rating °F (°C)	212 (100)
Response Type	ESFR
System Type	Wet
Maximum Area of Coverage	See NFPA 13
Minimum Area of Coverage	See NFPA 13
Maximum Slope Ceiling	See NFPA 13
Maximum Spacing	See NFPA 13
Minimum Spacing	See NFPA 13
Deflector Distance from Walls	See NFPA 13
Deflector to Top of Storage	See NFPA 13
Deflector to Ceiling Distance	6"- 14" (150-350mm)
Maximum Ceiling Height	48ft (14.6m)
Maximum Storage Height	43ft (13.1m)
Storage Arrangement	Single and double row rack storage, palletized and solid pile storage. No open top containers or solid shelves.
Commodity	Class I-IV commodities, encapsulated or nonencapsulated, and Cartoned Group A Unexpanded plastics
Sprinkler System Design	55 PSI (3.8 bar) design pressure,12 sprinklers in remote area
Obstruction Criteria	See NFPA 13
Minimum Aisle Width	8ft (2.4m)
Hose Stream Allowance and Duration	See NFPA 13

Installation

Model HL22 sprinklers are intended for installation in accordance with NFPA 13 and FM Loss Prevention Data Sheets 2-0 and 8-9, as well as the requirements of any Authorities Having Jurisdiction. See Table B for information on NFPA and FM Global design criteria for the Model HL22 sprinklers.

For threaded sprinklers only, use the Model W5 sprinkler wrench for removal and installation (Figure 3). Any other type of wrench may damage the sprinkler. A grooved wrench boss is provided on the sprinkler to limit the potential for the wrench to slip during installation.

Model HL22 sprinklers should be tightened between 14 - 40 lbs-ft (19 - 54 N·m) torque. Do not tighten sprinklers over the maximum recommended torque. Exceeding the maximum recommended torque may cause leakage or impairment of the sprinklers.

For grooved sprinklers, push the IGS™ Style V9 Sprinkler Coupling onto the grooved outlet until contact with the center leg of the gasket occurs. Align the sprinkler frame arms and the pads of the coupling with the sprinkler piping and tighten the coupling until the pads of the coupling meet. For additional information, please reference Victaulic® technical bulletin I-V9.

Caution: When handling sprinklers, hold sprinklers only by the frame arms and do not apply any force on the link assembly. Damaged sprinklers must be replaced immediately.

Maintenance

Reliable Model HL22 sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers.

Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Model W5 Sprinkler Wrench **Figure 3**

Ordering Information

Specify:

- Sprinkler: [HL22]
- Temperature Rating: [165°F (64°C)] [212°F (100°C)]
- End Connection: [1" NPT] [ISO7 R-1]
  [Victaulic® IGS™ Style V9 Sprinkler Coupling]

Note: 1" S/142 IGS™ grooved welded outlets are also available from Reliable.

Victaulic® IGS™ Style V9 Sprinkler Coupling installation bit - One bit provided in each box of 25 sprinklers.

P/N 9999970287

Reliable®

Model JL-14 & JL-17 ESFR Pendent Sprinklers

175 psi (12 bar) rated

Features

- cULus, VdS, and LPCB listed as an ESFR sprinkler
- FM Approved as a quick-response, storage and non-storage sprinkler
- Fusible link operating element
- Compact design

Product Description

The Reliable Models JL-14 and JL-17 are Early Suppression Fast Response (ESFR) Sprinklers with nominal K-factors of 14.0 (200 metric) and 16.8 (240 metric), respectively. The sprinklers use a levered fusible alloy solder link in either a 165°F (74°C) or a 212°F (100°C) temperature rating. These sprinklers are designed to respond quickly to growing fires and will deliver a heavy water discharge to “suppress” rather than “control” fires.

FM Approvals classifies the Model JL-14 and JL-17 as quick-response sprinklers, storage and non-storage, when used in accordance with FM Global Property Loss Prevention Data Sheets.

The JL-14 and JL-17 sprinklers are available with 3/4” NPT or ISO7-1R3/4 (BSPT) threads, and the JL-17 is also available with the Victaulic® IGS™ Style V9 Sprinkler Coupling*.

Model JL-14 and JL-17 ESFR sprinklers are designed to be shorter and more compact than other ESFR sprinklers, allowing greater flexibility with regard to distance from ceilings and obstructions. The JL-14 and JL-17 ESFR sprinklers are also less susceptible to damage due to smaller deflector and frame design. The lighter JL-14 and JL-17 ESFR sprinklers passed rough use and abuse listing tests without plastic protectors

***Note:** Victaulic® and IGS™ are trademarks of Victaulic Company.

Model JL-17 ESFR Sprinkler

Model JL-17 Sprinkler w/ Victaulic® IGS™ Style V9 Sprinkler Coupling

Model JL-14 ESFR Sprinkler

Models JL-14 & JL-17 ESFR Pendent Sprinklers — **Table A**

Model	Nominal K-factor gpm/psi$^{1/2}$ (L/min/bar$^{1/2}$)	Approvals	Sprinkler Identification Number (SIN)
JL-14	14.0 (200)	cULus, FM, VdS, LPCB, CNBOP-PIB	RA1812
JL-17	16.8 (240)	cULus, FM, VdS, LPCB, CNBOP-PIB	RA1914

Model JL-14 ESFR Sprinkler — SIN RA1812

Technical Specifications
Style: Pendent
Connection: 3/4" NPT or ISO7-1R3/4 (BSPT) threads
Nominal K-Factor: 14.0 (200 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Operating Element: Brass Alloy
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy
Kick Spring: Stainless Steel Alloy

Sprinkler Finishes
Bronze

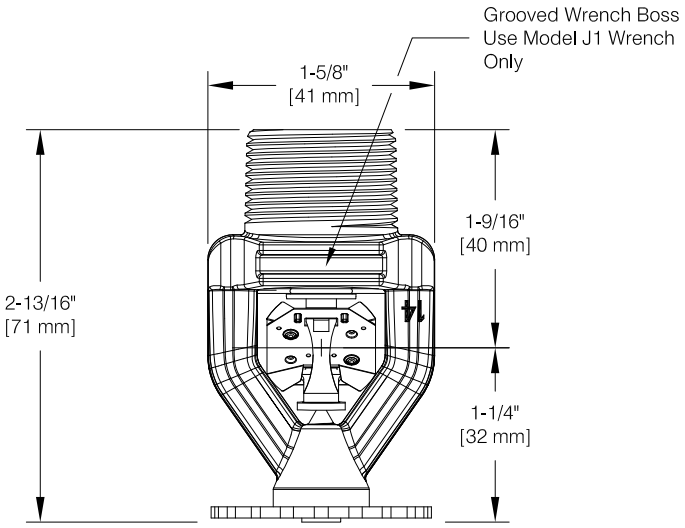
Sensitivity
Fast-Response
Quick-Response (FM)

Temperature Ratings
Ordinary: 165°F (74°C)
Intermediate: 212°F (100°C)

Sprinkler Wrench
Model J1

Listings and Approvals
cULus
FM Approved
VdS
LPCB
CNBOP-PIB

Model JL-14 Sprinkler Components and Dimensions — **Figure 1**



Model JL-17 ESFR Sprinkler — SIN RA1914

Technical Specifications
Style: Pendent
Connection: 3/4" NPT or ISO7-1R3/4 (BSPT) threads, Victaulic® IGS™ Style V9 Sprinkler Coupling
Nominal K-Factor: 16.8 (240 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Operating Element: Brass Alloy
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy
Kick Spring: Stainless Steel Alloy

Sprinkler Finishes
Bronze

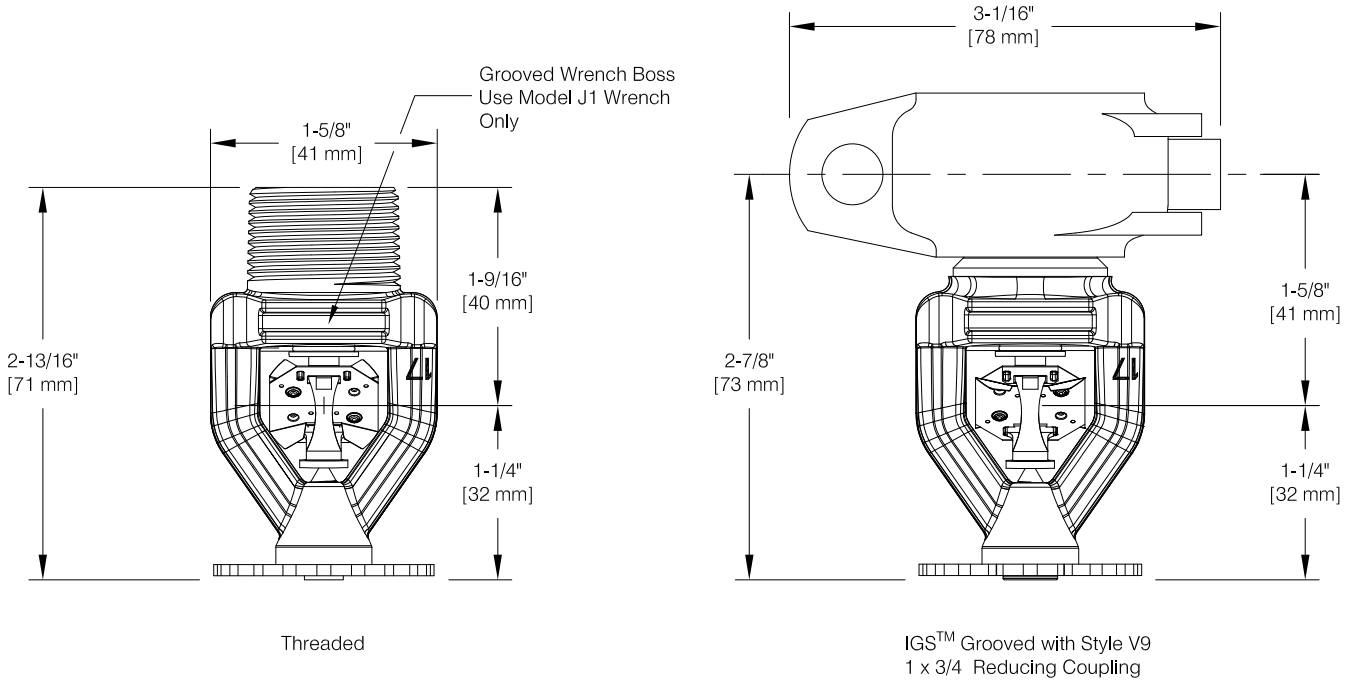
Sensitivity
Fast-Response
Quick-Response (FM)

Temperature Ratings
Ordinary: 165°F (74°C)
Intermediate: 212°F (100°C)

Sprinkler Wrench
Model J1

Listings and Approvals
cULus
FM Approved
VdS
LPCB
CNBOP-PIB

Model JL-17 Sprinkler Components and Dimensions — **Figure 2**



Model JL-14 and JL-17 Commodity Selection and Design Criteria Overview **Table B**

Storage Type	NFPA	FM GLOBAL
Sprinkler Type	ESFR	Storage
Response Type	ESFR	Quick Response
System Type	Wet	Wet
Temperature Rating °F (°C)	165 (74), 212 (100)	165 (74), 212 (100)
Roof Construction	See NFPA 13	See FM Global 2-0
Ceiling Slope	See NFPA 13	See FM Global 2-0
Maximum Coverage Area	See NFPA 13	See FM Global 2-0
Minimum Coverage Area	See NFPA 13	See FM Global 2-0
Maximum Spacing	See NFPA 13	See FM Global 2-0
Minimum Spacing	See NFPA 13	See FM Global 2-0
Minimum Clearance to Commodity	See NFPA 13	See FM Global 2-0
Sprinkler Distance to Ceiling	See NFPA 13	See FM Global 2-0
Open Frame, Single, Double, Multiple Row, or Portable Rack Storage of Class I-IV, Cartoned Unexp Plastics	See NFPA 13	See FM 2-0 & 8-9
Solid Pile or Palletized Storage of Class I - IV and Cartoned Unexp Plastics	See NFPA 13	See FM 2-0 & 8-9
Idle Pallet Storage	See NFPA 13	See FM 2-0, 8-9 & 8-24
Rubber Tire Storage	See NFPA 13	See FM 2-0 & 8-3
Rolled Paper Storage	See NFPA 13	See FM 8-21
Flammable Liquid Storage	See NFPA 30	See FM 7-29
Aerosol Storage	See NFPA 30B	See FM 7-31
Auto Components in Portable Racks	N/A	N/A

Installation

Model JL-14 and JL-17 sprinklers are intended for installation in accordance with NFPA 13 and FM Loss Prevention Data Sheets 2-0 and 8-9, as well as the requirements of any Authorities Having Jurisdiction. See Table B for information on NFPA and FM Global design criteria for the Model JL-14 and JL-17 sprinklers.

For threaded sprinklers only, use the Model J1 sprinkler wrench for removal and installation. Any other type of wrench may damage the sprinkler. A grooved wrench boss is provided on the sprinkler to limit the potential for the wrench to slip during installation.

When handling sprinklers, hold sprinklers only on frame arms and do not apply any force on the link assembly. Model JL-14 and JL-17 sprinklers should be tightened between 14 - 40 ft-lbs (19 - 54 N-m) torque. Sprinklers not tightened to recommended torque may cause leakage or impairment of the sprinkler. Damaged sprinklers must be replaced immediately.

For grooved sprinklers, push the IGS™ Style V9 Sprinkler Coupling onto the grooved outlet until contact with the center leg of the gasket occurs. Align the sprinkler frame arms and the pads of the coupling with the sprinkler piping and tighten the coupling until the pads of the coupling meet. For additional information, please reference Victaulic® technical bulletin I-V9.

Caution: When handling sprinklers, hold sprinklers only by the frame arms and do not apply any force on the link assembly.

Note: 1" S/142 IGS™ grooved welded outlets are also available from Reliable.

Victaulic® IGS™ Style V9 Sprinkler Coupling installation bit - One bit provided in each box of 25 sprinklers.

Model J1 Sprinkler Wrench **Figure 3**

Maintenance

Model JL-14 and JL-17 ESFR Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinkler with soap and water, ammonia or any other cleaning fluid. Replace any sprinkler that has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used, to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

Once operated, automatic sprinklers cannot be reassembled and reused. New sprinklers of the same size, type and temperature rating must be installed. A cabinet of replacement sprinklers should be provided for this purpose.

Listings and Approvals

1. UL Listed and ULC Certified for Canada (cULus)
2. FM Approved (FM)
3. VdS Certified (VdS)
4. Loss Prevention Certification Board Approved (LPCB)
5. CNBOP-PIB Technical Approval (CNBOP-PIB)

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify:

- Sprinkler: [JL-14] [JL-17]
- Temperature Rating: [165°F (64°C)] [212°F (100°C)]
- End Connection: [3/4" NPT] [ISO7-1R3/4 (BSPT)] [*JL-17 only* Victaulic® IGS™ Style V9 Sprinkler Coupling]

P/N 9999970379

Reliable®

Model GXLO Series Sprinkler

Storage and Non-Storage Sprinklers
K11.2 (160 metric)

Product Description

Reliable Model GXLO (extra-large orifice) upright and pendent sprinklers are standard coverage, standard response sprinklers that utilize a robust center strut, solder in compression thermal element. These sprinklers are intended for use in hydraulically calculated control mode density area (CMDA) storage and non-storage occupancies in accordance with the area/density curves of NFPA 13 or other applicable standards.

The Model GXLO sprinkler is FM Approved as a standard response storage and non-storage sprinkler when used in accordance with FM Global Property Loss Prevention Data Sheets.

For new installations, the sprinkler is provided with either 3/4-inch NPT or ISO 7-R3/4 threads. The upright version is also available with 1/2-inch NPT or ISO 7-R1/2 threads for retrofit installations only. Sprinklers without guards are installed using the Model H wrench.

For use as an intermediate level sprinkler, the Model GXLO upright sprinkler is available with a factory installed water shield. Various other water shields, guards, or guard/shield options are also available for both upright and pendent models (please refer to Technical Specifications on following pages). Sprinkler guards or guard/shields may be installed in the field or factory installed. Use of the Model JV sprinkler wrench is required for installation where a guard is added to the sprinkler prior to threading the assembly into a fitting.

Upright

Pendent

Model GXLO Series Sprinklers

Upright with Factory Installed Shield

Model GXLO Specifications — **Table A**

Style	Sprinkler Identification Number (SIN)	Listings and Approvals	Sensitivity	K-Factor
Upright	R2921	cULus, FM	Standard Response	11.2 (160 metric)
Pendent	R2916	FM		

Model GXLO Upright Sprinkler — SIN R2921

Technical Specifications
Style: Upright
Threads: 3/4" NPT or ISO 7-1R3/4
1/2" NPT or ISO 7-1R1/2 for Retrofit Application ONLY
Nominal K-Factor: 11.2 (160 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Thermal Sensor: Solder Capsule
Sprinkler Frame: Brass Alloy
Button/Cup: Brass Alloy
Sealing Assembly: Brass with PTFE
Load Screw: Bronze
Deflector: Bronze Alloy
Levers: Bronze Alloy
Ejection Spring: Stainless Steel

Sprinkler Finishes
See Table C)

Sensitivity
Standard Response

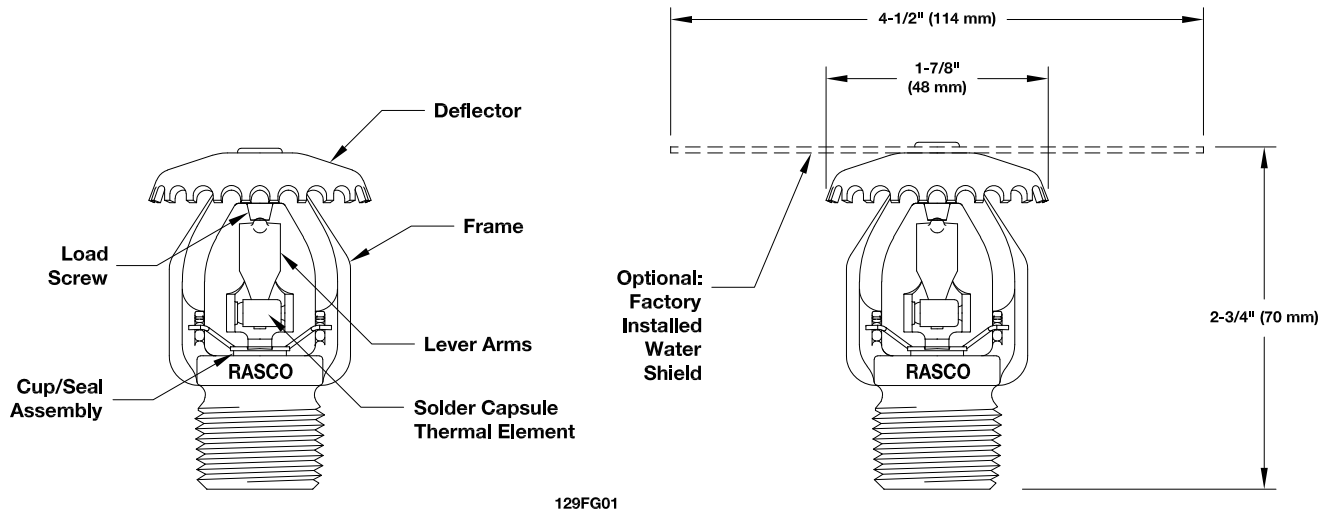
Temperature Ratings
See Table D

Guards & Shields
D-6 Guard & Water Shield (cULus)
D-7 Guard & Water Shield (FM)
Water Shield (factory installed) (FM)

Sprinkler Wrench
Model H
Model JV (when guard is installed prior to make-in)

Listings and Approvals
cULus Listed
FM Approved

Model GXLO Upright Components and Dimensions — **Figure 1**



COMPONENTS **DIMENSIONS**

Model GXLO Pendent Sprinkler — SIN R2921

Technical Specifications
Style: Pendent
Threads: 3/4" NPT or ISO 7-1R3/4
Nominal K-Factor: 11.2 (160 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Thermal Sensor: Beryllium Nickel Solder Link
Sprinkler Frame: Brass Alloy
Button/Cup: Brass Alloy
Sealing Assembly: Brass Alloy with PTFE
Load Screw: Bronze
Deflector: Bronze Alloy
Levers: Bronze Alloy

Sprinkler Finishes
See Table C

Sensitivity
Standard Response

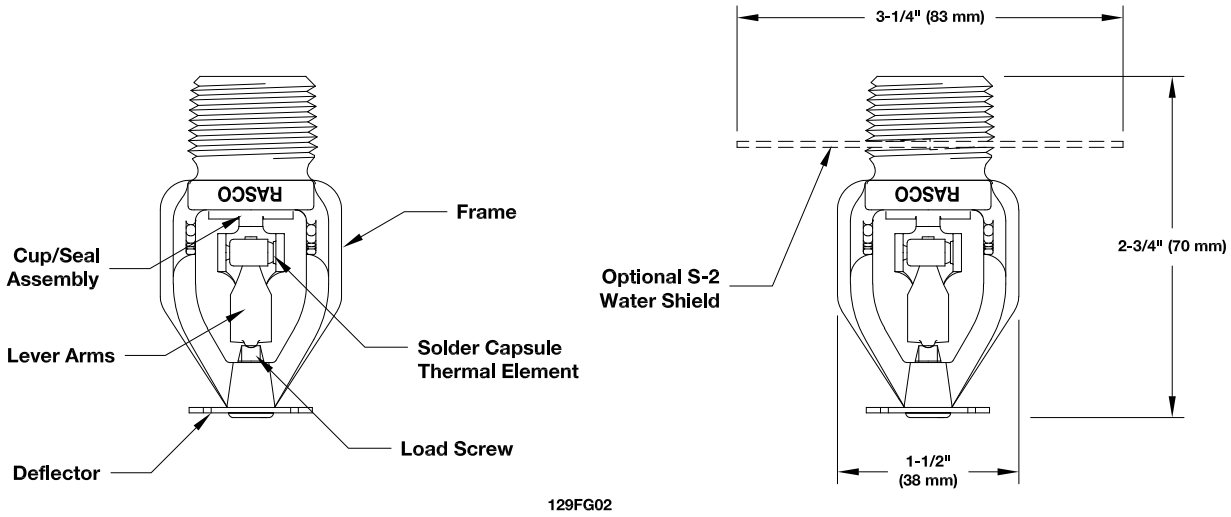
Temperature Ratings
See Table D

Guards & Shields
D-8 Guard (FM)
D-9 Guard & Water Shield (FM)

Sprinkler Wrench
Model H
Model JV (when guard is installed prior to make-in)

Listings and Approvals
FM Approved

Model GXLO Pendent Components and Dimensions — **Figure 2**



COMPONENTS **DIMENSIONS**

Model GXLO Commodity Selection and Design Criteria Overview **Table B**

Storage Type	NFPA	FM GLOBAL
Sprinkler Type	CMDA	Storage
Response Type	SR	SR
System Type	Pendent - Wet Upright - Wet, Dry, Preaction	Pendent - Wet Upright - Wet, Dry, Preaction
Temperature Rating °F (°C)	165, 212, 286 (74, 100, 141)	165, 212, 286 (74, 100, 141)
Roof Construction	See NFPA 13	See FM Global 2-0
Ceiling Slope	See NFPA 13	See FM Global 2-0
Maximum Coverage Area	See NFPA 13	See FM Global 2-0
Minimum Coverage Area	See NFPA 13	See FM Global 2-0
Maximum Spacing	See NFPA 13	See FM Global 2-0
Minimum Spacing	See NFPA 13	See FM Global 2-0
Minimum Clearance to Commodity	See NFPA 13	See FM Global 2-0
Sprinkler Distance to Ceiling	See NFPA 13	See FM Global 2-0
Open Frame, Single, Double, Multiple Row, or Portable Rack Storage of Class I - IV Commodity and Group A Plastic	See NFPA 13	See FM 2-0 & 8-9
Solid Pile or Palletized Storage of Class I - IV Commodity and Group A Plastic	See NFPA 13	See FM 2-0 & 8-9
Idle Pallet Storage	See NFPA 13	See FM 2-0,8-9 & 8-24
Rubber Tire Storage	See NFPA 13	See FM 8-3
Rolled Paper Storage	See NFPA 13	Pendent - N/A Upright - See FM 8-21
Flammable Liquid Storage	See NFPA 30	See FM 7-29 and 8-9
Aerosol Storage	See NFPA 13	See FM 7-31
Auto Components in Portable Racks	N/A	N/A

Sprinkler Finishes **Table C**

Standard Finishes	Special Application Finishes	
Bronze	Lead Plated [1]	165°F (74°C), 212°F (100°C) and 286°F (141°C) Temp. Ratings
Chrome [1]	Wax [1] [2]	165°F (74°C) Clear Wax, 212°F (100°C) Brown Wax
	Wax/Lead [1] [2]	165°F (74°C) Clear Wax, 212°F (100°C) Brown Wax

[1] cULus, upright (without shield) only.
[2] 212°F (100°C) Brown wax may be used on 286°F (141°C) Sprinklers when maximum ambient temperatures do not exceed 150°F (66°C).

Temperature Ratings **Table D**

Classification	Sprinkler Rating		Maximum Ambient Temperature		Frame Color
	°F	°C	°F	°C	
Ordinary	165	74	100	38	Uncolored
Intermediate	212	100	150	66	White
High	286	141	225	107	Blue

Installation

Model GXLO sprinklers must be installed according to appropriate NFPA Standards, FM Global Loss Prevention Data Sheets, and/or the requirements of the authority having jurisdiction.

Use only the Model H sprinkler wrench for sprinkler installation or use the Model JV wrench to install the sprinkler/guard assembly (Figure 3). Any other type of wrench may damage the sprinkler. Damaged sprinklers must be replaced immediately.

A leak tight joint should be obtained with a torque of 14 to 20 lb-ft (19 to 27 N·m) for 3/4 inch NPT and ISO 7-R3/4 thread sprinklers. For 1/2 inch NPT and ISO 7-R1/2 thread sprinklers the recommended installation torque is 8 to 18 lb-ft (11 to 24 N·m). Exceeding the maximum recommended torque may cause leakage or impairment of the sprinklers.

Wrenches **Figure 3**

Model H Wrench (sprinkler)

Model JV Wrench (with guard installed)

Maintenance

Reliable Model GXLO sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers.

Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering.

Model GXLO Sprinkler
- [Upright] [3/4" NPT] [ISO 7-R3/4]
- [Pendent] [3/4" NPT] [ISO 7-R3/4]
- [Upright Retrofit] [1/2" NPT] [ISO 7-R1/2]
- [Upright with factory installed shield]

Temperature Rating
- [165°F (74°C)] [212°F (100°C)] [286°F (141°C)]

Finish
- See Table C

Guard/Shield
- See Technical Specifications

Sprinkler Wrench
- [Model H] [Model JV (required with pre-installed guards)]

P/N 9999970286

Reliable®

Model WP56 and WP56L
Specific Application Window Sprinklers

cULus Listed
K5.6 (80)

Features

- cULus Listed to provide complete wetting of various glass surfaces
- Fast Response Specific Application Pendent Vertical Sidewall sprinkler
- Listed corrosion resistant finishes available (WP56 only)

Product Description

Reliable Model WP Series Window Protection Sprinklers are fast response, pendent vertical sidewall, specific application sprinklers designed to provide complete coverage and wetting of heat strengthened, tempered, or ceramic glass windows.

These sprinklers were tested and listed by Underwriters Laboratories for their ability to maintain the integrity of a window assembly placed in a test furnace for a 2-hour period. The test is based upon gas flow into the furnace as required to achieve a temperature in the furnace in the absence of sprinklers matching the standard time-temperature curve in ASTM E119.

Where approved in accordance with Sections 104 of the International Building Code and International Fire Code, which in part authorizes the use of alternative materials and methods, Model WP Series Window Sprinklers may be used as interior protection of non-operable windows or glazing that are part of a fire resistance rated wall in sprinklered or non-sprinklered buildings. With the thermal operating elements removed, these sprinklers may also be used for outdoor exposure protection of non-operable windows or glazing when installed on a deluge system in accordance with NFPA requirements.

Model WP Series Window Protection Sprinklers are available in a variety of finishes (see Table D). Model WP56 sprinklers in white polyester, black polyester, or Electroless Nickel PTFE (ENT) finishes are cULus Listed as corrosion resistant sprinklers.

WP56 Pendent Vertical Sidewall

WP56L Pendent Vertical Sidewall

Model WP Series Sprinkler Summary — **Table A**

Sprinkler Model	Operating Element	Sprinkler Identification Number (SIN)
WP56 Pendent Vertical Sidewall	3mm Glass Bulb	R501
WP56L Pendent Vertical Sidewall	Fast-Response Fusible Link	R502

Model WP56 Window Protection Pendent Vertical Sidewall — SIN R501

Technical Specifications
Style: Pendent Vertical Sidewall
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 250 psi (17 bar)

Material Specifications
Operating Element: 3mm glass bulb
Sprinkler Frame: Brass Alloy
Cap: Copper Alloy
Sealing Washer: Nickel Alloy with PTFE
Load Screw: Copper Alloy
Deflector: Bronze Alloy

Sprinkler Finishes
(See Table D)

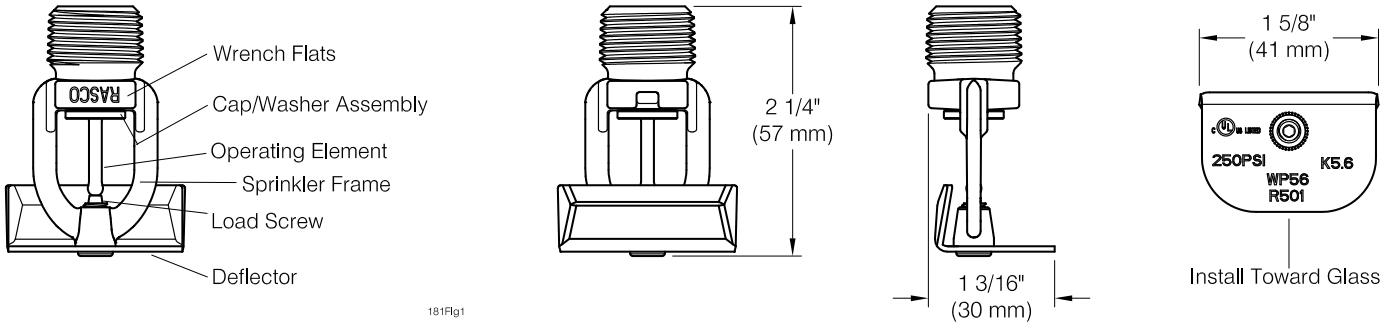
Sensitivity
Fast Response

Temperature Ratings
155°F (68°C)
200°F (93°C)

Sprinkler Wrenches
Model W2

Listings and Approvals
cULus Listed Specific Application

Model WP56 Pendent Vertical Sidewall Components and Dimensions — Figure 1



COMPONENTS **DIMENSIONS** **DEFLECTOR**

Model WP56 Minimum Flow and Residual Pressure — Table B

Max. Coverage Length ft. (m)	Flow gpm (l/min)	Pressure psi (bar)
12 (3.7)	15 (57)	7.0 (0.48)

Model WP56L Window Protection Pendent Vertical Sidewall — SIN R502

Technical Specifications
Style: Pendent Vertical Sidewall
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 250 psi (17 bar)

Material Specifications
Operating Element: Beryllium Nickel
Strut and Lever: Stainless Steel
Roto-clip: Stainless Steel
Sprinkler Frame: Brass Alloy
Cap: Copper Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Bronze Alloy

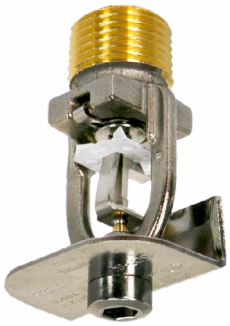
Sprinkler Finishes
(See Table D)

Sensitivity
Fast Response

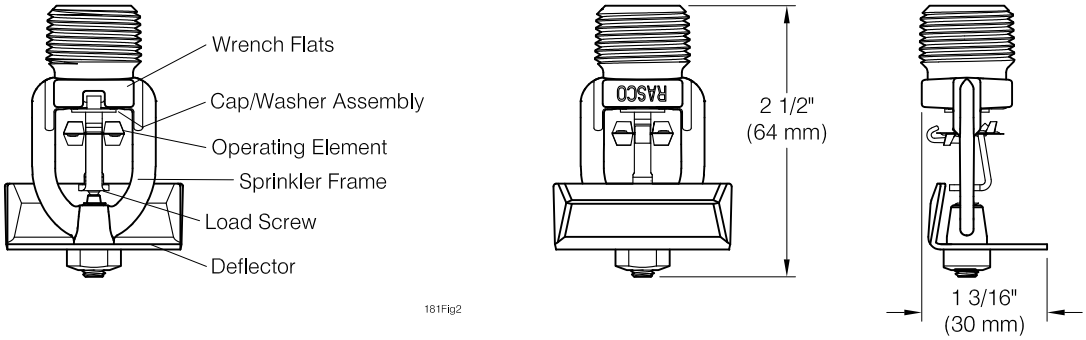
Temperature Ratings
165°F (74°C)
212°F (100°C)

Sprinkler Wrenches
Model W2

Listings and Approvals
cULus Listed Specific Application



Model WP56L Pendent Vertical Sidewall Components and Dimensions — **Figure 2**



COMPONENTS **DIMENSIONS** **DEFLECTOR**

Model WP56L Minimum Flow and Residual Pressure — **Table C**

Max. Coverage Length ft. (m)	Flow gpm (l/min)	Pressure psi (bar)
12 (3.7)	15 (57)	7.0 (0.48)

The Reliable Model WP Series Specific Application Window Sprinklers are cULus Listed for use as "Specific Application Window Sprinkler" and as open sprinklers for use on an exterior deluge system.

Where approved, Model WP Series Window Protection Sprinklers can be used for interior protection of windows or glazing in a sprinklered building or non-sprinklered building in accordance with Section 104 of the IBC ("Alternate Materials, Design, and Methods of Construction and Equipment"). In addition, Model WP Series Window Protection sprinklers with the operating element removed may be used in outdoor, deluge exposure applications per NFPA design requirements.

General Criteria

Area of Use
Model WP Series Window Sprinklers may be used when acceptable to the Authority Having Jurisdiction where:
- Window sprinklers are installed on each side of an interior window that is part of a fire resistance rated wall (Figure 3).
- Window sprinklers are installed on the inside of an exterior window to protect an adjacent building from fire within your building, i.e., to provide separation from an adjacent space (Figure 4).
- Open window sprinklers are installed on a deluge system on the exterior of the building to protect your building from fire within an adjacent building, i.e., exposure protection (Figure 5).

Maximum Length of Window Assembly
Unlimited

Maximum Height of Exposed Glazing
13 ft (4.0 m) (Refer to Figure 9)

Horizontal (Intermediate) Mullions
The use of an upper Model WP Series Window Sprinkler to protect the lower section of a window with horizontal mullions has not been evaluated, and is outside the scope of the specific application listing of the sprinkler (Figure 8)

Blinds, Curtains, and Other Coverings
Blinds, curtains, and other window coverings shall NOT be installed between the Model WP Series Window Protection sprinklers and the glass surface.

Minimum Clearance from Face of Glass to Combustible Materials
For glass types other than UL Listed fire-protection-rated Glazing Material meeting the requirements of ANSI/UL10B or ANSI/UL10C for a 1/3 hour fire resistance rating, all combustible materials shall be kept 2 in. (50 mm) from the front face of the glass using a minimum 36 in. (900 mm) pony wall or other method acceptable to the authority having jurisdiction.

Glass Type
The following types and thicknesses of glass are recognized for use with Reliable Model WP Series Window Sprinklers:
- Non-operable, heat-strengthened, tempered, single-glazed (single pane), not less than 1/4 in. (6 mm) thick;
- Non-operable, heat-strengthened, tempered, double-glazed (double pane or insulated), not less than 1/4 in. (6 mm) thick;
- Non-operable, heat-strengthened, tempered, triple-glazed (triple pane or insulated), not less than 1/4 in. (6 mm) thick; or
- Non-operable, stronger glass window assemblies, not less than 1/4 in. (6 mm) thick.

Glass Joint Types
- Non-combustible frame and vertical mullions with standard EPDM rubber gasket seals (Figure 6).
- Separate panes butt-jointed together vertically and sealed with silicone sealant (Figure 7).

Installation Criteria

System Protection Type
- Interior: Wet Systems
- Outside Exposure: Deluge

Sprinkler Coverage
- Install window sprinkler(s) in each segment of windows separated by vertical mullions (Figure 6)
- Install window sprinklers a maximum of 12 ft (3.7 m) apart for windows with vertical butt joints (Figure 7)

Sprinkler Location
- Sprinklers must be positioned with respect to the glass in order to insure the entire surface is covered
- Locate sprinkler centerline 4 in (100 mm) minimum and 12 in (300 mm) maximum from face of glass
- Locate the horizontal blade of the deflector 2 in (50 mm) minimum and 4 in (100 mm) maximum down from the top of the exposed glass

Maximum Distance Between Window Sprinklers
12 ft (3.7 m)

Minimum Distance Between Window Sprinklers
6 ft (1.8 m) unless separated by a baffle or mullion which extends to the back of the sprinkler deflector (Figures 6 and 7)

Distance from Side of Vertical Mullion
4 in (100 mm) minimum; 7 ft (2.1 m) maximum (Figures 5 & 7)

Distance from Standard Sprinklers
6 ft (1.8 m) minimum, or the minimum specified for the standard sprinkler, unless separated by a baffle

Sprinkler Escutcheons
Model WP Series Window Sprinklers may be installed exposed, or used with any metallic surface mount or extended escutcheon provided the sprinkler location specified in this technical bulletin are met. The use of Model WP Series Window Sprinklers with recessed escutcheons has not been evaluated and is outside the scope of the sprinkler listing.

Temperature Rating
Sprinkler temperature selection shall be in accordance with the requirements of the NFPA 13. Intermediate temperature rated sprinklers are recommended where sprinklers are used at exterior windows.

Recommended Hydraulic Requirements

The Authority Having Jurisdiction should be consulted to determine the hydraulic requirements for each installation.

Interior Protection in a Sprinklered Building
Calculate all Model WP Series Window Sprinklers along the most demanding 46.5 linear feet (14.2 linear meters) on one side of the glazing. (Note: This length is based upon 1.2 times the square root of standard 1500 square foot light hazard area of operation in accordance with NFPA 13 area/density curves.)

If a reduction to the standard 1500 square foot design area is made (as allowed by NFPA 13 for the use of quick response sprinklers) the length of the design area may also be reduced accordingly, but in no case shall be less than 36 linear feet (11 linear meters).

When the length of the window is less than 46.5 linear feet (14.2 linear meters), calculate all Model WP Series Window Sprinklers on one side of the glazing.

Interior Protection in a Non-Sprinklered Building
Calculate all Model WP Series Window Sprinklers on the most demanding side of the window.

Exterior Exposure Protection
Calculate all Model WP Series Window Sprinklers on the deluge system. (Note: All other aspects of deluge system design to be in accordance with NFPA 13.)

Water Demand
If Model WP Series Window Sprinklers are located within the hydraulic design area of the building sprinkler system and a single fire is expected to operate both window sprinklers and ceiling sprinklers, the water demand of the window sprinklers shall be added to the hydraulic demand of the ceiling system and balanced at the point of connection to the system.

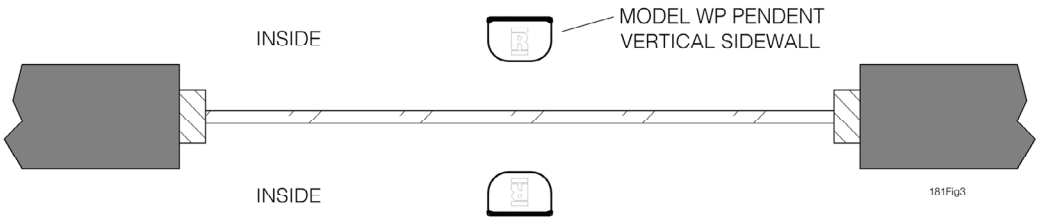
If Model WP Series Window Sprinklers are not located within the hydraulic design area of the building sprinkler system, it is not necessary to add the water demand of the window sprinklers to the remote area calculation. A supplemental calculation may be required, however, to verify the water supply is capable of supplying the simultaneous operation of the window sprinklers and the adjacent ceiling sprinklers.

The required flow and pressure per sprinkler must be in accordance with Tables B and C, as applicable to the sprinkler and installation.

Water Supply Duration
The duration of the water supply shall be the greater of (a) the minimum requirement of NFPA 13, or (b) the rating period (as expressed in minutes) obtained when window sprinklers are used to provide an equivalency rating.

Non-Operable Window in Interior Fire Resistance Rated Wall - WP Sprinklers on Both Sides

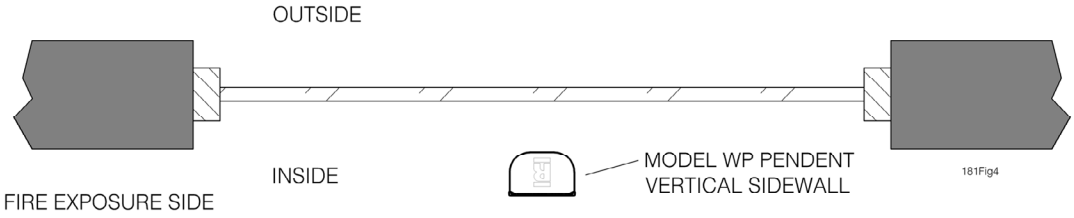
Figure 3



Model WP Series Window Sprinklers may be used when acceptable to the Authority Having Jurisdiction where window sprinklers are installed on each side of an interior window that is part of a fire resistance rated wall.

Non-Operable Window in Exterior Fire Resistance Rated Wall - WP Sprinklers Inside

Figure 4

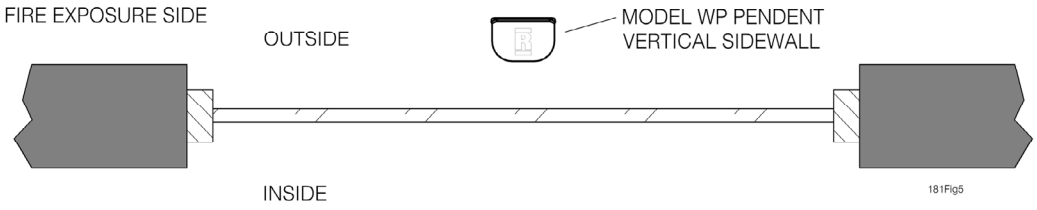


Model WP Series Window Sprinklers may be used when acceptable to the Authority Having Jurisdiction where window sprinklers are installed on the inside of an exterior window to protect an adjacent space from fire within your building, i.e., to provide separation from an adjacent space.

NOTE: Intermediate temperature rated sprinklers are recommended for use at exterior windows.

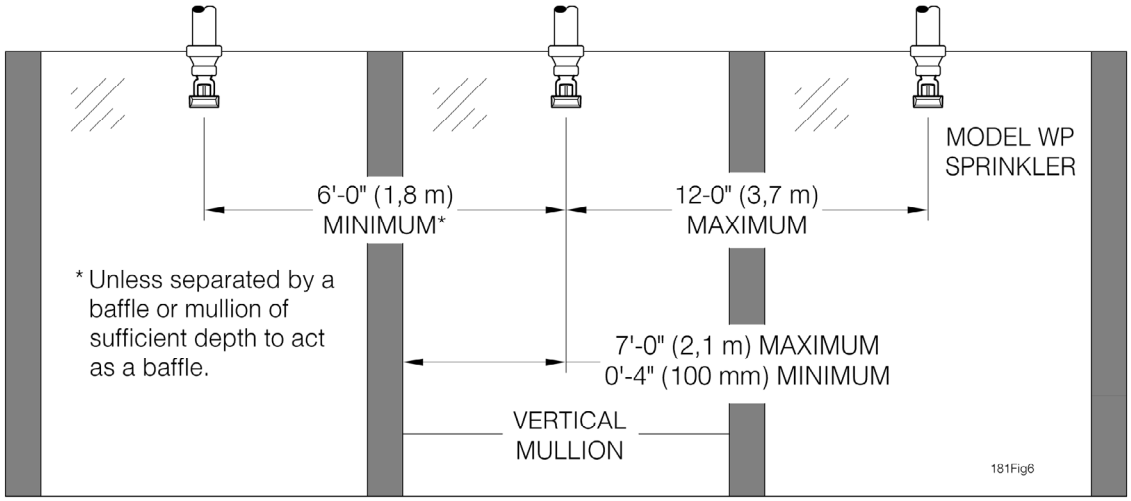
Non-Operable Window in Exterior Fire Resistance Rated Wall - WP Sprinklers Outside

Figure 5

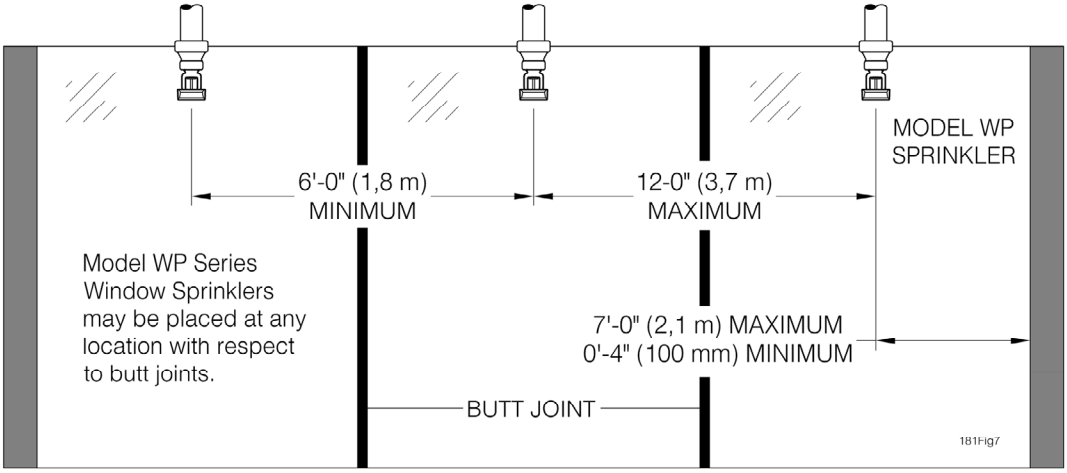


Model WP Series Window Sprinklers may be used when acceptable to the Authority Having Jurisdiction where open window sprinklers are installed on a deluge system on the exterior of the building to protect your building from fire outside your building, i.e., exposure protection.

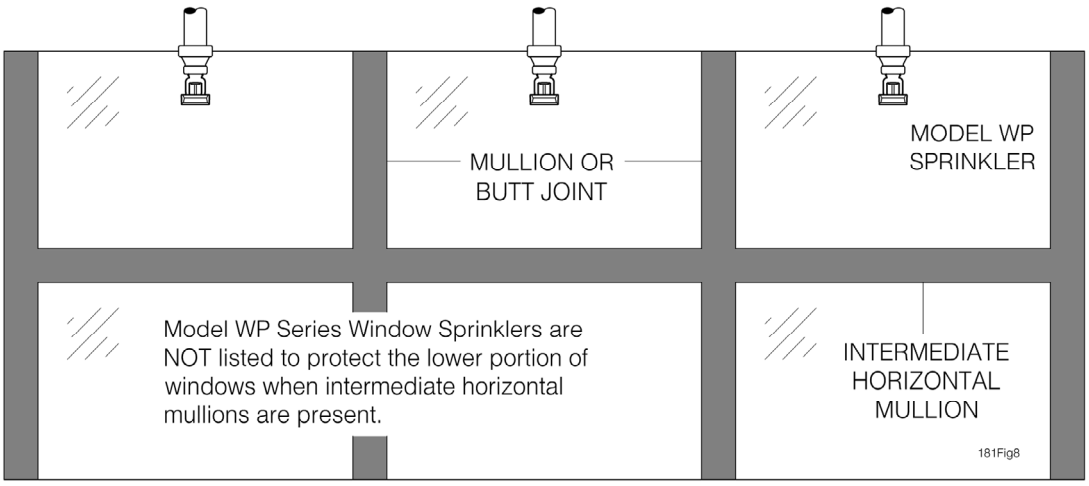
Multiple Windows Separated by Mullions **Figure 6**



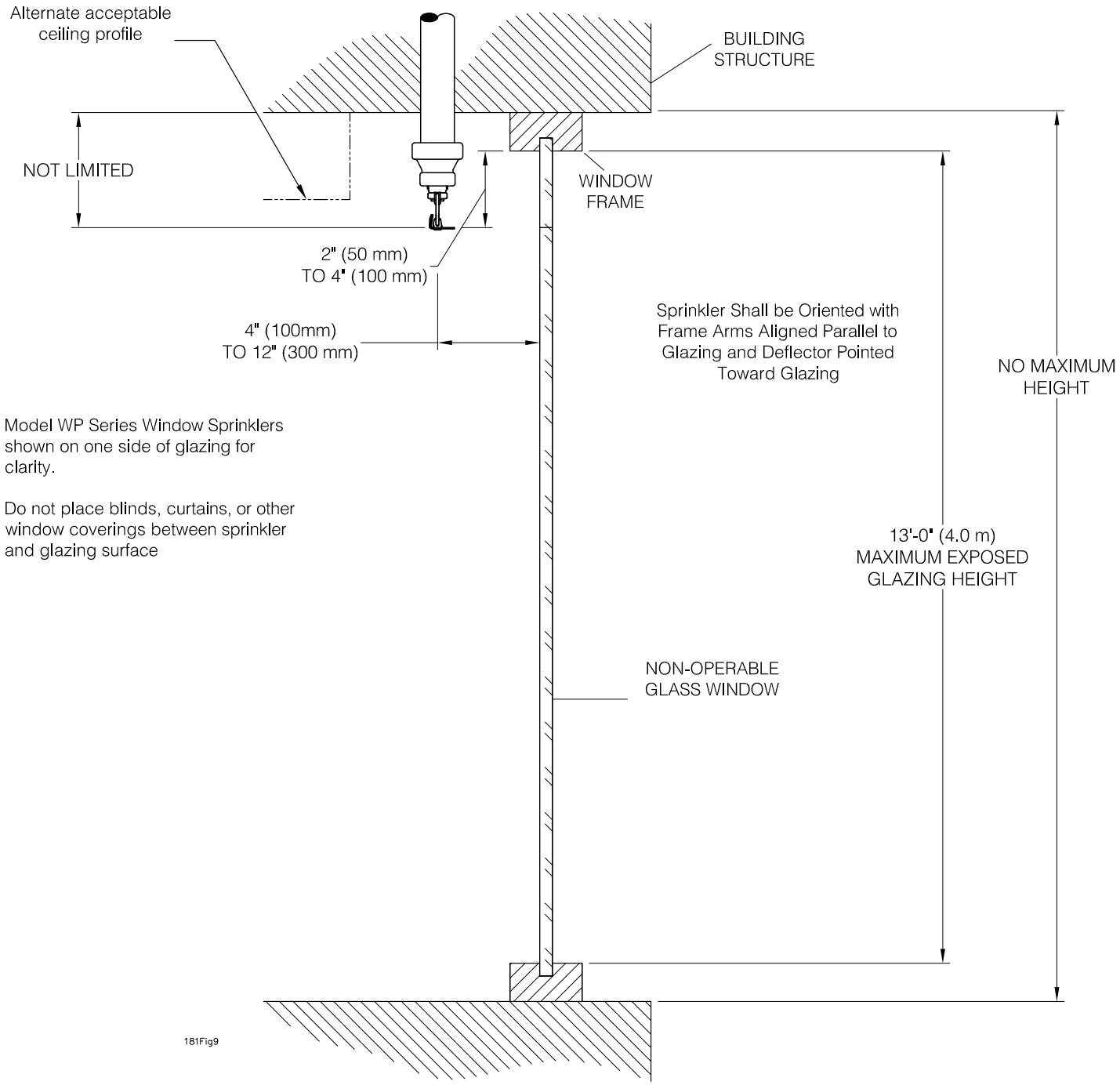
Multiple Windows Separated by Butt Joints **Figure 7**



Windows with Horizontal Mullions **Figure 8**



Model WP Pendent Vertical Sidewall Sprinkler Installation Dimensions **Figure 9**



Installation

Model WP sprinklers are to be installed in the pendent vertical sidewall position with their frame arms parallel to the glass surface and the curved portion of the deflector oriented towards the glass (Refer to Fig. 9). When installing the Model WP sprinklers use only the Reliable Model W2 installation wrench. Usage of any other type of installation wrench may damage the sprinkler and will immediately void the manufacturer's warranty.

Recommended installation torque is 14-20 ft-lbs (19 – 27 N-m). Do not tighten sprinklers over the maximum recommended torque. Exceeding the maximum recommended torque may cause leakage or impairment of the sprinklers.

Maintenance

Reliable Model WP series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers.

Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Model WP56 / WP56L Sprinkler Finishes[1] **Table D**

Standard Finishes	Special Finishes
None (Bronze) Chrome Plated White Polyester[2]	Bright Brass Dull Chrome Black Polyester[2] Custom Color Polyester Electroless Nickel PTFE [2]

Notes:
[1] Paint or any other coating applied over the factory finish will void all approvals and warranties.
[2] cULus Listed Corrosion Resistant finish (WP56 only)

Ordering Information

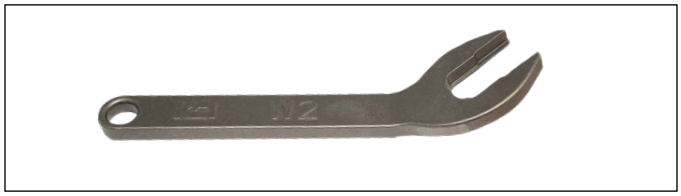
Specify:

Sprinkler Model
- WP56, WP56L

Temperature Rating
- WP56 [155°F (68°C)] [200°F (93°C)]
- WP56L: [165°F (74°C)] [212°F (100°C)]

Threads
- NPT or ISO7-1

Finish
- See Table D



Model W2 Wrench

P/N 9999970579

Model KFR-CCS Combustible Concealed Space Sprinkler

cULus Listed

Features

- cULus Listed for areas of coverage up to 256 square feet
- Sprinkler may be installed on the same branch line that supplies sprinklers below ceiling
- Nominal K-factor of 5.6 (80 metric)
- Fusible link operating element
- Quick response 212°F (100°C) fusible link operating element
- Standard brass finish

Product Description

Reliable's Model KFR-CCS Combustible Concealed Space Sprinkler is a quick response, upright, special sprinkler designed to provide protection of specific light hazard combustible and noncombustible concealed spaces requiring sprinkler protection. The KFR-CCS sprinkler is specifically listed for the protection of shallow combustible concealed spaces described in NFPA 13.

The Model KFR-CCS Sprinkler utilizes a fast response solder-link fusible element that has demonstrated response times in laboratory tests which are five to ten times faster than standard response sprinklers. This feature enables the sprinkler to apply water to a fire much faster than standard response sprinklers of the same temperature rating.

Application

The Model KFR-CCS sprinkler is specifically listed for use in horizontal combustible concealed spaces with a slope not exceeding 2:12 with combustible wood truss, wood joist construction, or bar joist construction having a combustible upper surface and where the depth of the space is less than 36" (914 mm) from deck to deck, from deck to ceiling, or with double wood joist construction with a maximum of 36" (914 mm) between the top of the bottom joist and the bottom of the upper joist. NFPA 13 permits the use of the Model KFR-CCS sprinkler (a) where the space is less than 12" (305 mm) from deck to deck or deck to ceiling, and/or (b) where a portion of the protected space exceeds 36" (914 mm).

Installation

Model KFR-CCS Sprinklers are to be installed in the upright position with their frames arms parallel to the pipe (Refer to Figs. 4 through 9). When installing the Model KFR-CCS sprinkler use only the Reliable Model W2 installation wrench. Usage of any other type of installation wrench may damage the sprinkler and will immediately void the manufacture's warranty.

Model W2 Wrench

Note: A leak tight ½" NPT (R1/2) sprinkler joint can be obtained with an installation torque of approximately 8 -18 ft-lbs (10.8 – 24.4 N-m). Do not tighten sprinklers over these recommended limits. Doing so may cause leakage and/or premature operation.

Maintenance

Model KFR-CCS Sprinklers should be inspected and maintained in accordance with the applicable version of NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Remove dust by using compressed air or by vacuuming, provided equipment does not touch the sprinkler. Replace any sprinkler which has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify: Model KFR-CCS Sprinkler

Model KFR-CCS Combustible Concealed Space Upright Sprinkler — SIN RA4454

Technical Specifications
Style: Upright
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications
Thermal Sensor: Nickel Alloy
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finish
Standard Brass

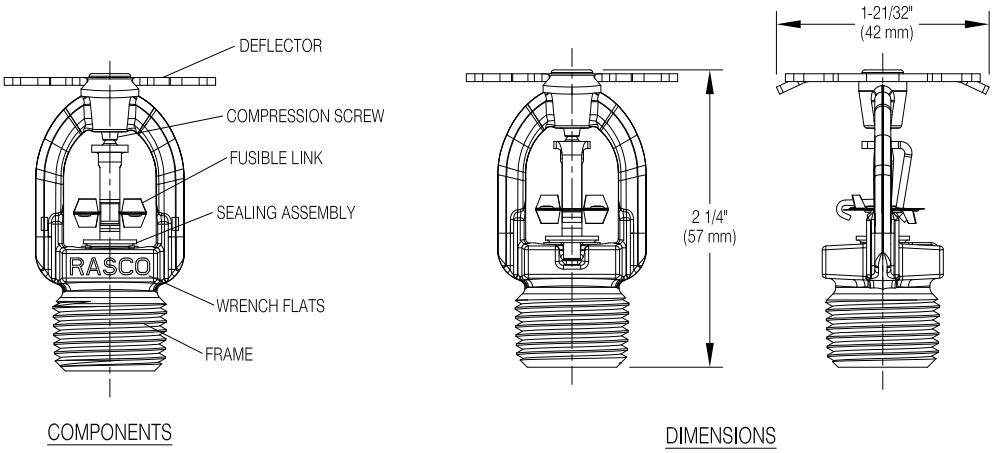
Temperature Ratings
212°F (100°C)

Sensitivity
Fast Response

Sprinkler Wrench
Model W2

Approvals
cULus Listed

Model KFR-CCS Components and Installation Dimensions — **Figure 1**



Model KFR-CCS General Application Criteria

Minimum Distance (Spacing) Between Sprinklers
6' (1.83 m)
Note: This minimum spacing does not apply to any additional sprinklers that are required for protection of CPVC piping that is offset over an obstruction (refer to figures 4 and 5).

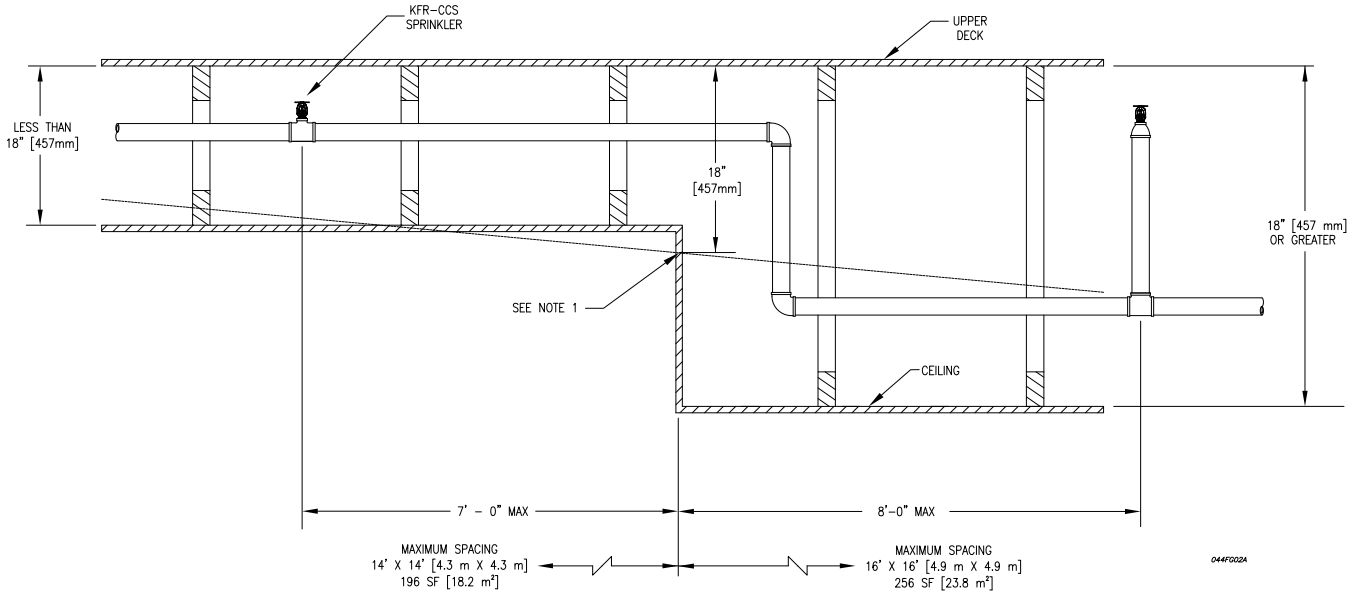
Maximum Distance (Spacing) Between Sprinklers
14' (4.27 m) for solid wood and composite wood joist construction. For wood truss or bar joist construction, 14' (4.27 m) for concealed spaces that are less than 18" (457 mm) in depth; 16' (4.88 m) for concealed spaces that are 18" (457 mm) or more in depth.

Maximum Coverage Area Per Sprinkler
196 ft2 (18.2 m2) for solid wood or composite wood joist construction. For wood truss or bar joist construction, 196 ft2 (18.2 m2) for concealed spaces that are less than 18" (457 mm) in depth; 256 ft2 (23.8 m2) for concealed spaces that are 18" (457 mm) or more in depth.

Note: Sprinkler spacing, and therefore coverage area, is determined by the depth of the concealed space. When transitions occur in the concealed space, the sprinklers may immediately be spaced at the largest approved coverage area per the above listings for the concealed space depth (refer to Fig. 2).

Obstruction Rules
All obstruction criteria per the applicable version of the NFPA 13 apply unless modified by this bulletin (refer to Fig. 3). The KFR-CCS is classified as an Extended Coverage Upright Spray Sprinkler where the maximum coverage area per sprinkler exceeds 225 ft2 (20.9 m^2). The KFR-CCS is classified as a Standard Upright Spray Sprinkler where the maximum coverage area per sprinkler is 225 ft^2 (20.9 m^2) or less.

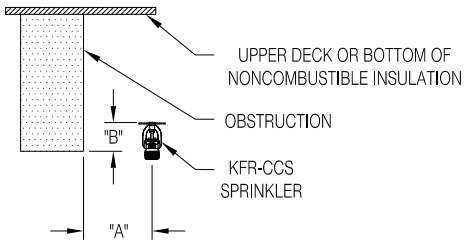
Model KFR-CCS Sprinkler Spacing at Change in Concealed Space Depth **Figure 2**



Note 1: For sloping concealed spaces, break point between sprinkler spacings is the point where the depth of the space equals 18" [457 mm].

Model KFR-CCS Specific Application Obstruction Criteria

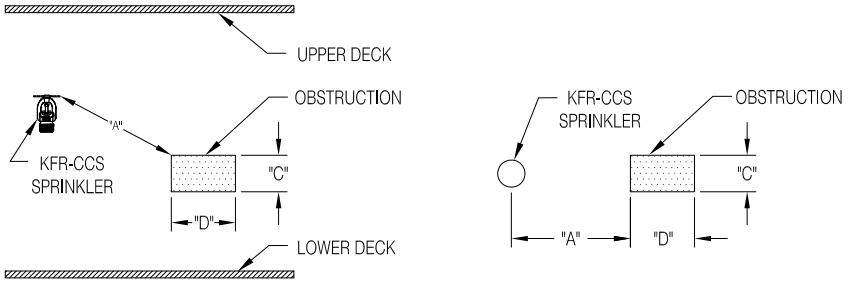
Figure 3



NOTE:
SPRINKLER DEFLECTOR MUST BE AT OR BELOW THE BOTTOM OF THE TOP CHORD OF THE TRUSS.

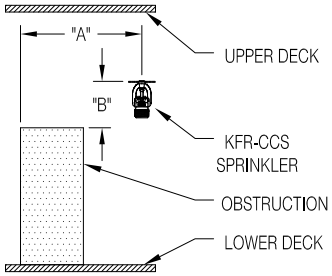
OTHER WEB MEMBERS AND GUSSETS SHALL NOT BE CONSIDERED OBSTRUCTIONS PROVIDED THE MINIMUM 4-1/2" LATERAL DISTANCE (FIG. 4, 6, & 8) REQUIRED BY THE SPECIFIC APPLICATION LISTING IS MAINTAINED.

DISTANCE FROM CENTERLINE OF SPRINKLER TO SIDE OF OBSTRUCTION. DIMENSION "A"	MAXIMUM ALLOWABLE DISTANCE OF DEFLECTOR ABOVE BOTTOM OF OBSTRUCTION. DIMENSION "B"
<12" [<305mm]	0" [0mm]
12" TO <18" [305mm TO <457mm]	2.5" [64mm]
18" TO <24" [457mm TO <610mm]	3.5" [89mm]
24" TO <30" [610mm TO <762mm]	5.5" [140mm]
30" TO <36" [762mm TO <914mm]	7.5" [191mm]
36" TO <42" [914mm TO <1067mm]	9.5" [241mm]
42" TO <48" [1067mm TO <1219mm]	12" [305mm]
48" TO <54" [1219mm TO <1372mm]	14" [356mm]
54" TO <60" [1372mm TO <1524mm]	16.5" [419mm]



ELEVATION VIEW PLAN VIEW

A≥3C OR 3D (USE DIMENSION C OR D, WHICHEVER IS GREATER)
MAXIMUM CLEAR DISTANCE REQUIRED IS 24 IN. (610 mm)



HORIZONTAL DISTANCE DIMENSION "A"	MINIMUM VERTICAL DISTANCE BELOW DEFLECTOR DIMENSION "B"
≤6" [≤152mm]	3" [76mm]
>6" TO 9" [>152mm TO 229mm]	4" [102mm]
>9" TO 12" [>229mm TO 305mm]	6" [152mm]
>12" TO 15" [>305mm TO 381mm]	8" [203mm]
>15" TO 18" [>381mm TO 457mm]	9.5" [241mm]
>18" TO 24" [>457mm TO 610mm]	12.5" [318mm]
>24" TO 30" [>610mm TO 762mm]	15.5" [394mm]
>30" [>762mm]	18" [457mm]

044FG03A

Model KFR-CCS Specific Application Criteria for CPVC Pipe Sprinkler Systems

When used with CPVC piping, the Model KFR-CCS Sprinkler is specifically listed to provide protection of combustible concealed spaces where the construction methods consist of:

1. Wood trusses or wood bar joist (Refer to Fig. 4)
2. Noncombustible insulation-filled solid wood or composite wood joists* (Refer to Fig. 5)

***Note:** In order to be considered "noncombustible insulation-filled, solid wood or composite wood joists" construction, the insulation (including insulation provided with a combustible vapor barrier), must completely fill the pockets between the joists to the bottom of the joists. Insulation installed above the elevation of Model KFR-CCS sprinklers in wood truss, solid wood joist or composite wood joist must be secured into place with metal wire netting. The metal wire netting is intended to hold the insulation in place should the insulation become wet by the operation of Model KFR-CCS Sprinklers in the event of a fire.

In order to use the CPVC pipe and fittings, the horizontal runs of pipe must be a maximum of 6 in. (152 mm) above the ceiling or noncombustible ceiling insulation, or 1/3 the depth of concealed space (as measured from the top surface of the ceiling to the bottom of the deck above), whichever is smaller (Refer to Figs. 4 & 5).

The CPVC piping can be used to supply the Model KFR-CCS Sprinklers as well as sprinklers installed below the ceiling. Unless modified by this technical data sheet, all guidelines provided by the CPVC pipe and fitting manufacturer must be followed.

When using 1 in. (DN25) or larger pipe, a hanger must be located at the truss nearest a sprig for purposes of restraint. If using 3/4 in. (DN19) piping, all sprigs over 12 in. (305 mm) must be laterally braced using methods described in the NFPA standards. Where the CPVC must be offset up and over an obstruction and the pipe exceeds the allowed horizontal positioning requirements specified above as well as shown in Figs. 4 and 5, additional Model KFR-CCS Sprinklers are to be installed to protect the CPVC products. A minimum lateral distance of 18 in. (457 mm) must be maintained between the CPVC pipe and heat pumps, fan motors, and heat lamps.

Concealed Space Area
The area of the concealed space is not limited; however, for both Figs. 4 and Fig. 5 where CPVC pipe is being utilized, draft-curtains or full height walls must be provided at 1,000 ft^2 (93 m^2) maximum areas. This draft curtain shall be at least 1/3 the depth of the concealed space or 8 in. (203 mm), whichever is greater, and be constructed using a material that will not allow heat to escape through or above the draft curtain.

System Type
Light hazard, wet pipe system.

Minimum Distance Away From Face of Wood Truss or Top Chord of Bar Joist
4.5 in. (114 mm) (Refer to Fig. 3)

Deflector Position
At or below the bottom of the top chord; 1.5 in. (38 mm) minimum to 4 in. (102mm) maximum below upper deck (or insulation if present) for wood truss construction or wood bar joist construction (Fig. 4).

1.5 in. (38 mm) minimum to 4 in. (102mm) maximum below bottom of insulation for noncombustible insulation-filled solid or composite joist construction (Fig. 5).

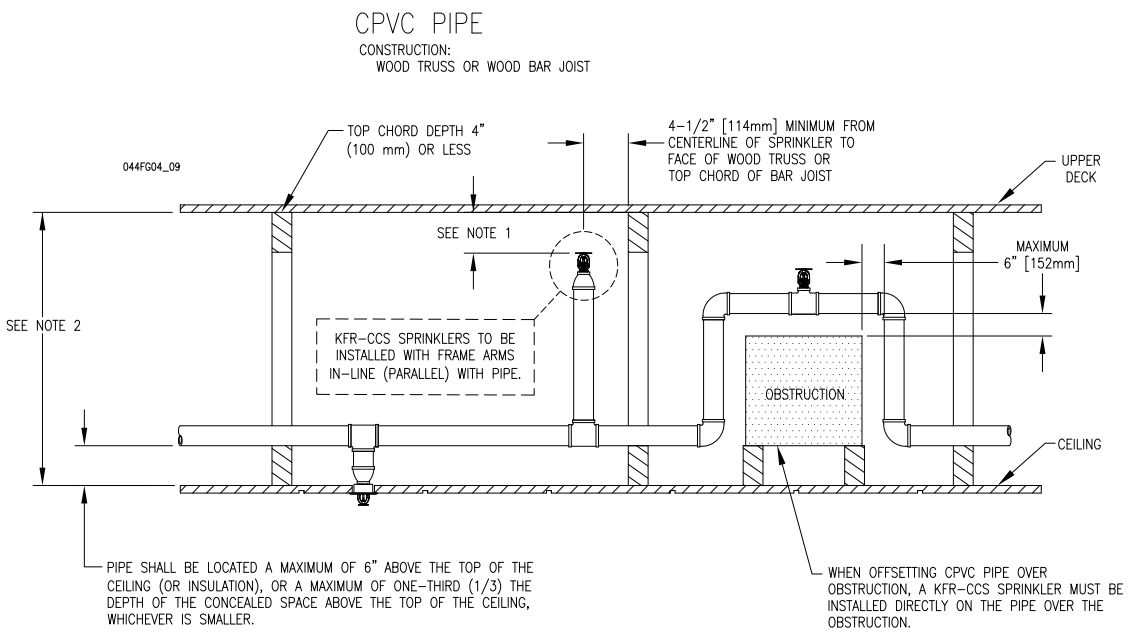
Hydraulic Design Area
Calculate all sprinklers within the draft curtain area, up to the 1,000 ft^2 (93 m^2) maximum draft curtain area.
Note: Additional sprinklers that are required for protection of CPVC piping that is offset over an obstruction do not need to be included in the remote area.

Required Density
0.10 gpm/ft^2 (4.08 Lpm/m^2)

Minimum Operating Pressure
7 psi (0.48 bar)

Model KFR-CCS CPVC Pipe

Figure 4

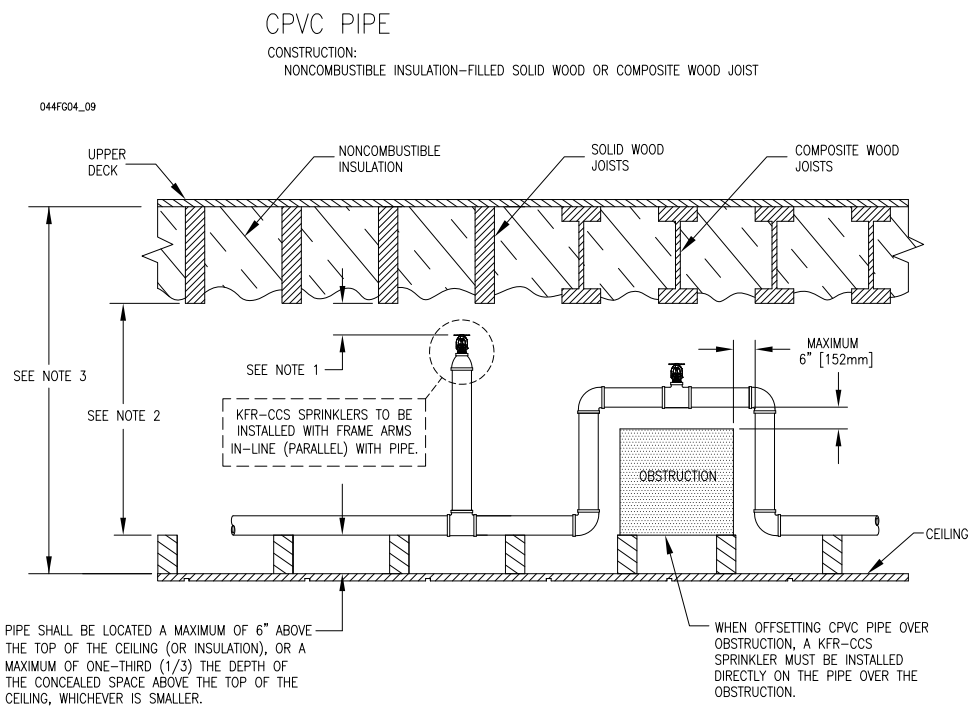


Note 1: Deflector at or below bottom of top chord; 1-1/2" (38 mm) minimum to 4" (102 mm) maximum below bottom of roof deck or insulation.

Note 2: Distance evaluated as part of cULus Listing: 12" to 36" (305 to 914 mm). NFPA 13 permits the installation of these sprinklers in combustible concealed spaces where (a) the distance from deck to deck or deck to ceiling is less than 12" (305 mm) and/or (b) a portion of the protected area exceeds a depth of 36" (914 mm).

Model KFR-CCS CPVC Pipe

Figure 5



Note 1: Deflector distance below bottom of joist/insulation to be 1-1/2" to 4" (38 mm to 102 mm).

Note 2: Distance evaluated as part of cULus Listing: 6" to 36" (152 to 914 mm). NFPA 13 permits the installation of these sprinklers in combustible concealed spaces where a portion of the protected area exceeds a depth of 36" (914 mm).

Note 3: Maximum distance evaluated as part of cULus Listing: 60" (1524 mm).

Model KFR-CCS Specific Application Criteria for Steel Pipe Systems

When used with steel piping, the Model KFR-CCS Sprinkler is specifically listed to provide protection of combustible concealed areas where the construction methods consist of:

1. Wood trusses or wood bar joists (Refer to Fig. 6)
2. Solid wood joist construction where the upper ceiling joists may have a maximum depth of 12 in. (305 mm). (Refer to Fig. 7).
3. Noncombustible insulation-filled, solid wood or composite wood joists* (Refer to Fig. 8)
4. Obstructed wood trusses; top chord more than 4" deep (Refer to Fig. 9).

***Note:** In order to be considered "noncombustible insulation-filled, solid wood or composite wood joists" construction, the insulation (including insulation provided with a combustible vapor barrier), must completely fill the pockets between the joists to the bottom of the joists. Insulation installed above the elevation of Model KFR-CCS sprinklers in wood truss, solid wood joist or composite wood joist must be secured into place with metal wire netting. The metal wire netting is intended to hold the insulation in place should the insulation become wet by the operation of Model KFR-CCS Sprinklers in the event of a fire.

Concealed Space Area
The area of the concealed space is not limited; however, for wood truss construction or concealed spaces of noncombustible bar joist construction (Refer to Fig. 6) draft-curtains or full height walls must be provided at 1,000 ft^2 (93 m^2) areas. The draft curtain shall be at least 1/3 the depth of the concealed space or 8 in. (203 mm), whichever is greater, and be constructed using a material that will not allow heat to escape through or above the draft curtain.

For solid wood joist construction (Refer to Fig. 7) and obstructed wood truss construction (Refer to Fig. 8), blocking must be provided in each joist or top chord channel at maximum 32 ft. (9.75 m) intervals. This blocking shall be installed to the full depth of the joist or top chord and be installed so as to not allow heat to escape through or above the blocking. The blocking must be constructed using a noncombustible material or be of the same material as the joist or truss member. Draft curtains must be protrude below the joist a minimum of 6 in. (152 mm) or 1/3 the space, whichever is greatest and run parallel with the joist spaced at 31 ft. (9.45 m) width maximum to limit the area to a maximum of 1,000 ft^2 (93 m^2). The draft curtain may be constructed of ¼ in. (6.4 m) plywood to prevent heat from escaping beyond the area.

For noncombustible insulation-filled, solid wood joist or composite wood joist construction (Refer to Fig. 9), the requirement for draft curtains or blocking does not apply.

System Type
Light hazard, wet or dry pipe system.

Deflector Position
At or below the bottom of the top chord; 1.5 in. (38 mm) minimum to 4 in. (102mm) maximum below upper deck (or insulation if present) for wood truss construction or wood bar joist construction (Fig. 6).

1.5 in. (38 mm) minimum to 2 in. (51 mm) maximum below the bottom of the top chord for spaces constructed of obstructed wood trusses (Fig. 8).

1.5 in. (38 mm) minimum to 2 in. (51 mm) maximum below the bottom of the upper joist for concealed spaces constructed of exposed solid wood joists (Fig 7).

1.5 in. (38 mm) minimum to 4 in. (102mm) maximum below bottom of insulation for noncombustible insulation-filled solid or composite joist construction (Fig. 9).

Minimum Distance Away From Face of Wood Truss or Top Chord of Bar Joist
4.5 in. (114 mm) (Refer to Fig. 4)

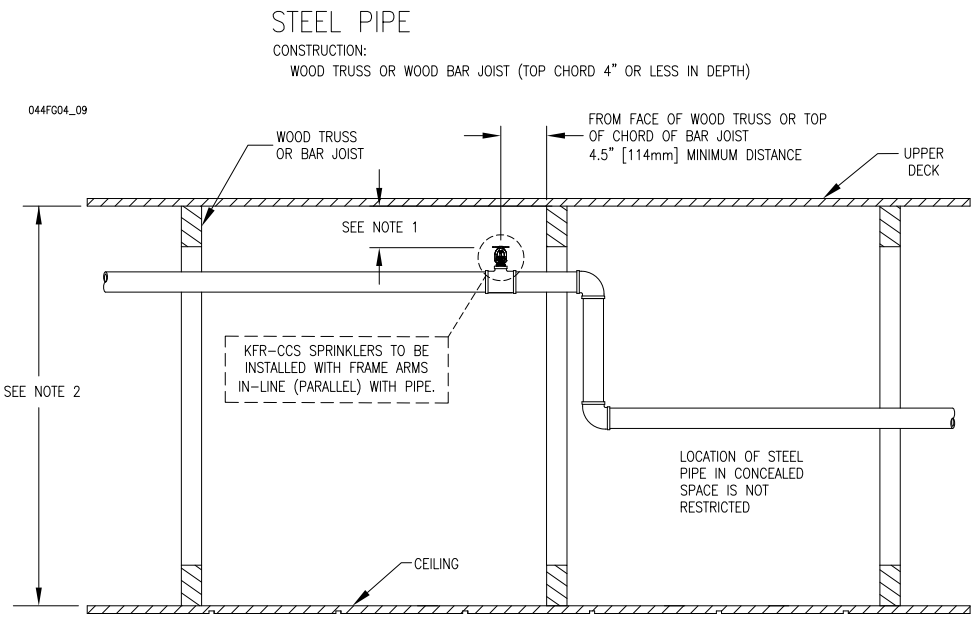
Hydraulic Design Area
For wood truss construction (Fig. 6), solid wood joist construction (Fig. 7), or obstructed wood truss construction (Fig. 8), calculate all sprinklers within the draft curtain area, up to the 1,000 ft^2 (93 m^2) maximum draft curtain area for both wet and dry pipe systems.

For noncombustible insulation-filled solid wood joist or composite wood joist construction (Fig. 9) where draft curtains are not required, calculate per the requirements of NFPA 13.

Required Density
0.10 gpm/ft^2 (4.08 Lpm/m^2)

Minimum Operating Pressure
7 psi (0.48 bar)

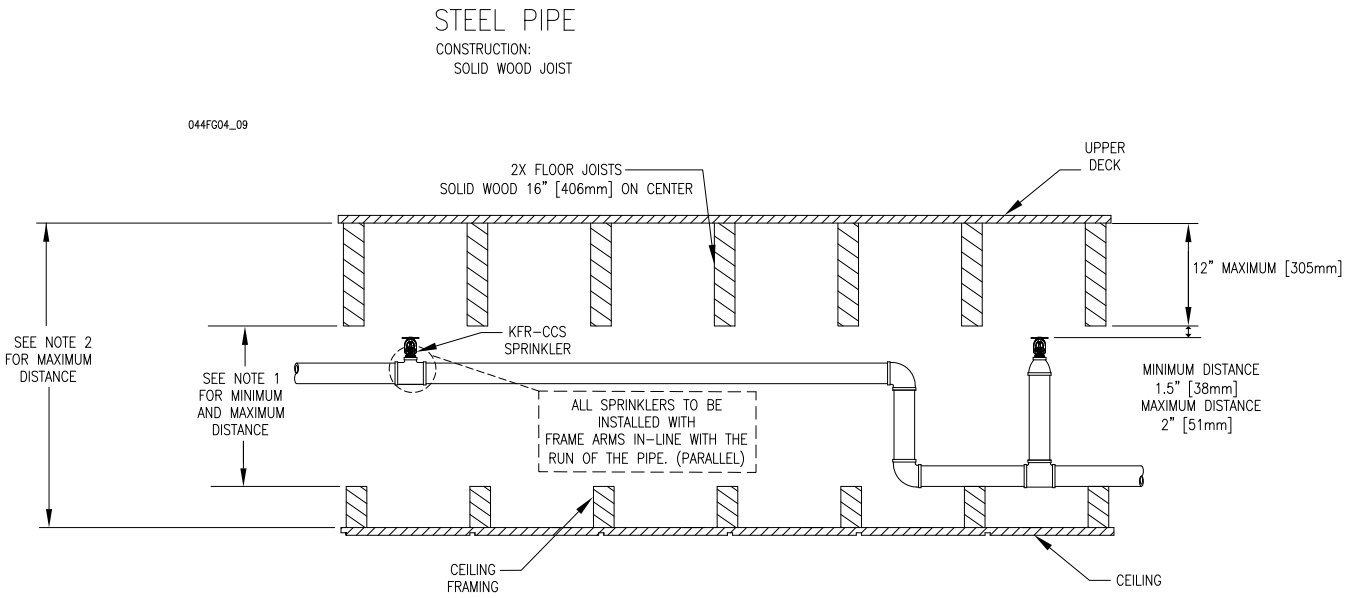
Model KFR-CCS Steel Pipe **Figure 6**



Note 1: Deflector at or below the bottom of the top chord; 1-1/2" (38 mm) to 4" (102 mm) below bottom of roof deck or insulation.

Note 2: Distance evaluated as part of cULus Listing: 12" to 36" (305 to 914 mm). NFPA 13 permits the installation of these sprinklers in combustible concealed spaces where (a) the distance from deck to deck or deck to ceiling is less than 12" (305 mm) and/or (b) a portion of the protected area exceeds a depth of 36" (914 mm).

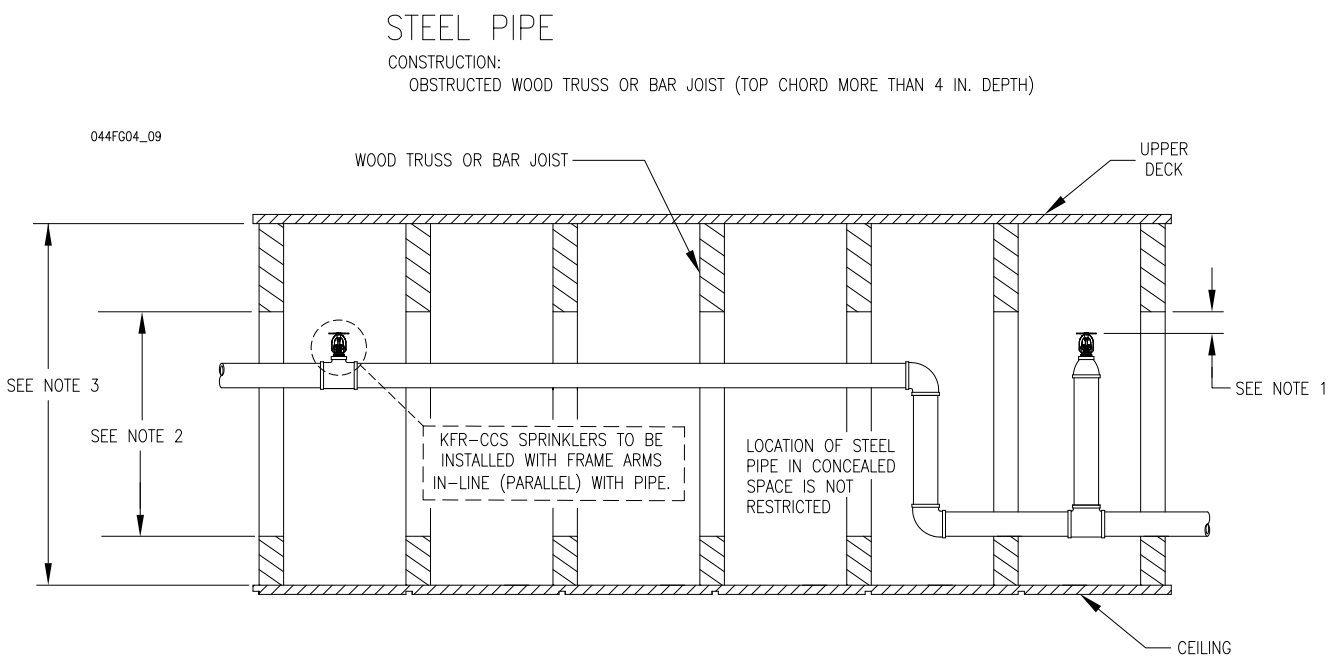
Model KFR-CCS Steel Pipe **Figure 7**



Note 1: Minimum to Maximum Distance evaluated as part of cULus Listing: 6" to 36" (152 to 914 mm). NFPA 13 also permits the installation of these sprinklers in combustible concealed spaces where (1) the distance from deck to deck or deck to ceiling is less than 12" (305 mm) or (2) a portion of the protected area exceeds a depth of 36" (914 mm).

Note 2: Maximum Distance evaluated as part of cULus Listing: 54" (1372 mm). NFPA 13 also permits the installation of these sprinklers in combustible concealed spaces where (1) the distance from deck to deck or deck to ceiling is less than 12" (305 mm) or (2) a portion of the protected area exceeds a depth of 36" (914 mm).

Model KFR-CCS Steel Pipe **Figure 8**

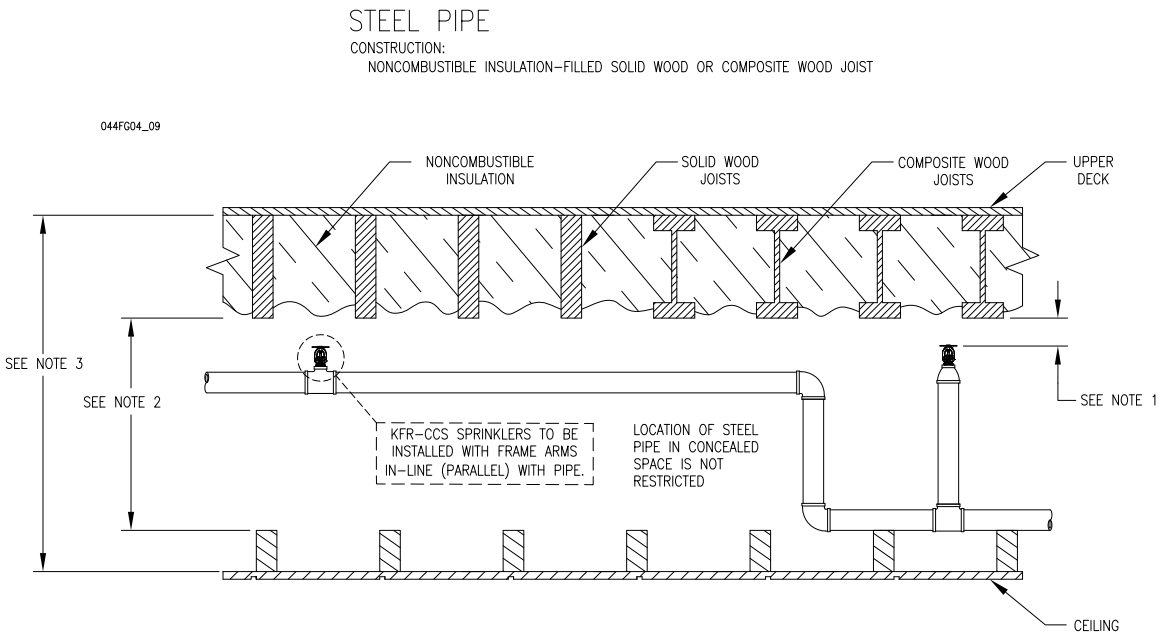


Note 1: Deflector distance below bottom of joist to be 1-1/2" to 2" (38 mm to 51 mm).

Note 2: Distance evaluated as part of cULus Listing: 6" to 36" (152 to 914 mm). NFPA 13 also permits the installation of these sprinklers in combustible concealed spaces where a portion of the protected area exceeds a depth of 36" (914 mm).

Note 3: Maximum distance evaluated as part of cULus Listing: 60" (1524 mm).

Model KFR-CCS Steel Pipe **Figure 9**



Note 1: Deflector distance below bottom of joist/insulation to be 1-1/2" to 4" (38 mm to 102 mm).

Note 2: Distance evaluated as part of cULus Listing: 6" to 36" (152 to 914 mm). NFPA 13 permits the installation of these sprinklers in combustible concealed spaces where a portion of the protected area exceeds a depth of 36" (914 mm).

Note 3: Maximum distance evaluated as part of cULus Listing: 60" (1524 mm).

P/N 9999970449

Reliable®

Model LT56 Series Special Sprinklers

Designed specifically for corridors and hallway

K5.6 (80 Metric)
cULus Listed

Features

- 28 ft x 10 ft (8.5 m x 3 m) max. coverage area
- cULus Listed for Light Hazard occupancies
- Increased spacing and reduced water demand in corridors compared with traditional extended coverage sprinklers

Product Description

Model LT56 series sprinklers are cULus Listed Specific Application sprinklers designed for installation in accordance with NFPA 13. The sprinklers produce a spray pattern that is specifically designed to cover long narrow spaces, such as corridors and hallways, with fewer sprinklers and less water demand compared with traditional extended coverage sprinklers.

Model LT56 series sprinklers are quick-response sprinklers for use in Light Hazard occupancies only. Model LT56 and Model LT56-300 sprinklers have a glass bulb operating element. Model LT56L, LT56L-300, and LT56C sprinklers have a fusible link operating element. Model LT56, LT56-300, LT56L, and LT56L-300 sprinklers are available with Model FV recessed escutcheons, Model FP recessed escutcheons, or Model CCP concealed cover plates. Model LT56C sprinklers require a Model G4/G5 flat concealed cover plate.

Models LT56 & LT56-300

Models LT56L & LT56L-300

Model FV Escutcheon

Model FP Escutcheon

Model G4/G5 Flat Cover Plate

Model CCP Cover Plate

Model LT56C Sprinkler

Table A

Sprinkler Model	Operating Element	Max. Working Pressure psi (bar)	Styles	Coverage Areas	Sprinkler Identification Number (SIN)
LT56	Glass Bulb	250 (17.2)	Pendent, Recessed Pendent or Conical Concealed Pendent	Table B	RA5814
LT56L	Fusible Link	250 (17.2)		Table C	R5814
LT56-300	Glass Bulb	300 (21)		Table D	RA5914
LT56L-300	Fusible Link	300 (21)		Table E	R5914
LT56C	Fusible Link	175 (12)	Flat Concealed	Table F	RA5994

Model LT56 Specific Application Sprinkler — SIN RA5814

Technical Specifications
Style: Pendent, Recessed Pendent, or Conical Concealed
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 250 psi (17.2 bar)
Min. Spacing: 14 ft. (4.3 m)

Material Specifications
Thermal Sensor: 3 mm glass-bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Sprinkler Finishes
(See Table H)

Sensitivity
Quick-response

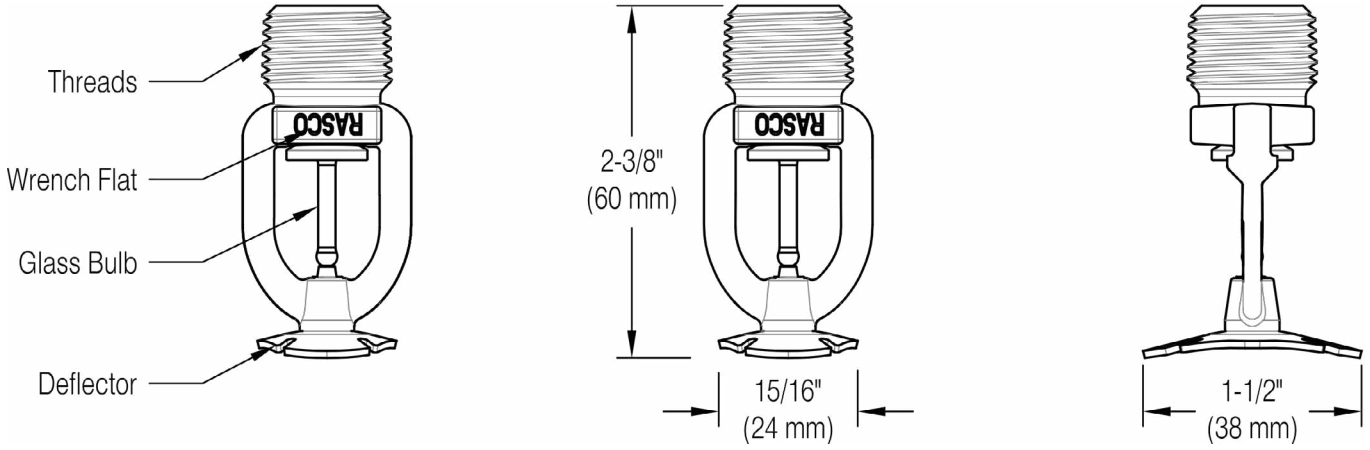
Temperature Ratings
155°F (68°C)
200°F (93°C)

Recessed Escutcheons/Cover Plates
Model FV recessed escutcheon
Model FP recessed escutcheon
Model CCP cover plate

Sprinkler Wrenches
Model W2 (pendent)
Model GFR2 (recessed and concealed)

Listings and Approvals
cULus Listed

Model LT56 Sprinkler Components and Dimensions — Figure 1



Model LT56 Sprinkler Hydraulic Design Criteria — Table B

Minimum Flow and Residual Pressure		
Max. Coverage Area ft. x ft. (m x m)	**Flow gpm (l/min)**	**Pressure psi (bar)**
28 x 8 (8.5 x 2.4)	23 (87)	16.9 (1.17)
28 x 10 (8.5 x 3.0)	28 (106)	25.0 (1.72)

Note: For coverage area dimensions less than or between those listed above, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.

Model LT56L Specific Application Sprinkler — SIN R5814

Technical Specifications
Style: Pendent, Recessed Pendent, or Conical Concealed
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 250 psi (17.2 bar)
Min. Spacing: 14 ft. (4.3 m)

Material Specifications
Thermal Sensor: Nickel Alloy Solder Link
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Sprinkler Finishes
(See Table H)

Sensitivity
Quick-response

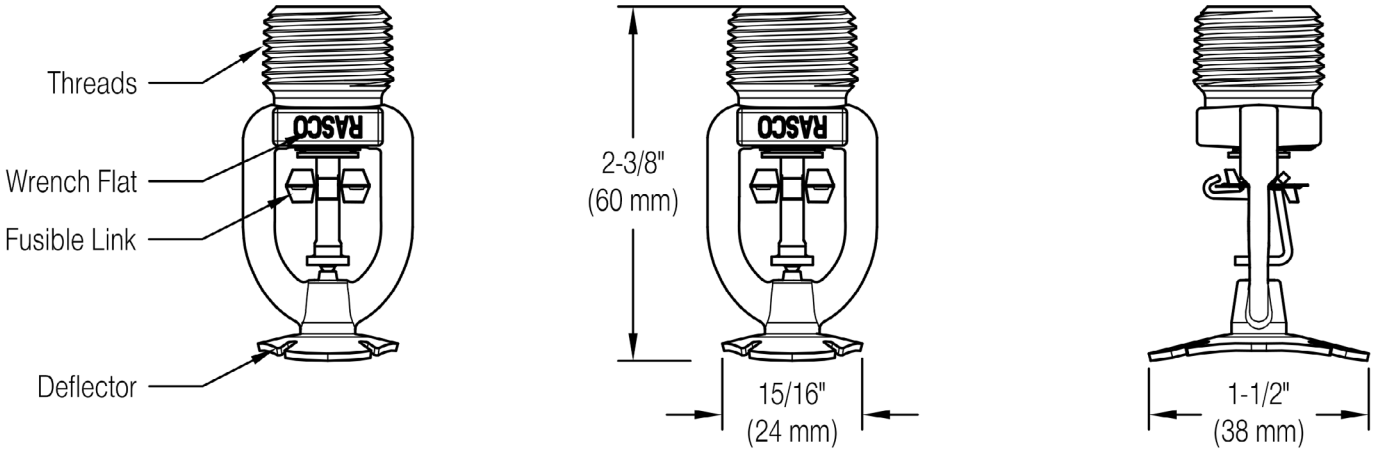
Temperature Ratings
165°F (74°C)
212°F (100°C)

Recessed Escutcheons/Cover Plates
Model FV recessed escutcheon
Model FP recessed escutcheon
Model CCP cover plate

Sprinkler Wrenches
Model W2 (pendent)
Model GFR2 (recessed and concealed)

Listings and Approvals
cULus Listed

Model LT56L Sprinkler Components and Dimensions — Figure 2



Model LT56L Sprinkler Hydraulic Design Criteria — Table C

Minimum Flow and Residual Pressure		
Max. Coverage Area ft. x ft. (m x m)	**Flow gpm (l/min)**	**Pressure psi (bar)**
28 x 8 (8.5 x 2.4)	23 (87)	16.9 (1.17)
28 x 10 (8.5 x 3.0)	28 (106)	25.0 (1.72)

Note: For coverage area dimensions less than or between those listed above, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.

Model LT56-300 Specific Application Sprinkler — SIN RA5914

Technical Specifications
Style: Pendent, Recessed Pendent, or Conical Concealed
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 300 psi (21 bar)
Min. Spacing: 14 ft. (4.3 m)

Material Specifications
Thermal Sensor: 3 mm glass-bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Sprinkler Finishes
(See Table H)

Sensitivity
Quick-response

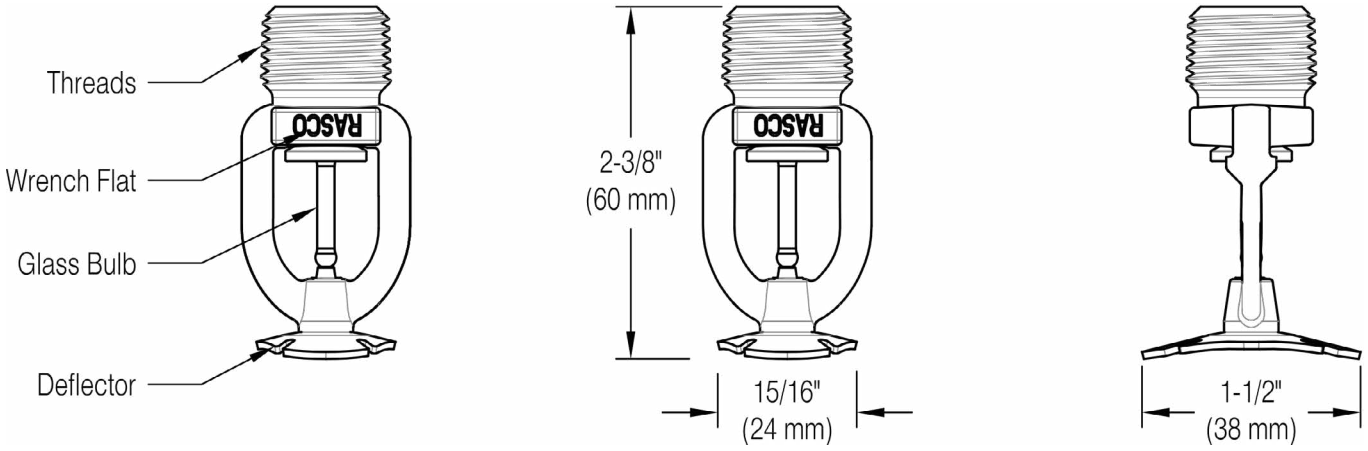
Temperature Ratings
155°F (68°C)
200°F (93°C)

Recessed Escutcheons/Cover Plates
Model FV recessed escutcheon
Model FP recessed escutcheon
Model CCP cover plate

Sprinkler Wrenches
Model W2 (pendent)
Model GFR2 (recessed and concealed)

Listings and Approvals
cULus Listed

Model LT56-300 Sprinkler Components and Dimensions — **Figure 3**



Model LT56-300 Sprinkler Hydraulic Design Criteria — **Table D**

Minimum Flow and Residual Pressure		
Max. Coverage Area ft. x ft. (m x m)	**Flow gpm (l/min)**	**Pressure psi (bar)**
28 x 8 (8.5 x 2.4)	23 (87)	16.9 (1.17)
28 x 10 (8.5 x 3.0)	28 (106)	25.0 (1.72)

Note: For coverage area dimensions less than or between those listed above, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.

Model LT56L-300 Specific Application Sprinkler — SIN R5914

Technical Specifications
Style: Pendent, Recessed Pendent, or Conical Concealed
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 300 psi (21 bar)
Min. Spacing: 14 ft. (4.3 m)

Material Specifications
Thermal Sensor: Nickel Alloy Solder Link
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Sprinkler Finishes
(See Table H)

Sensitivity
Quick-response

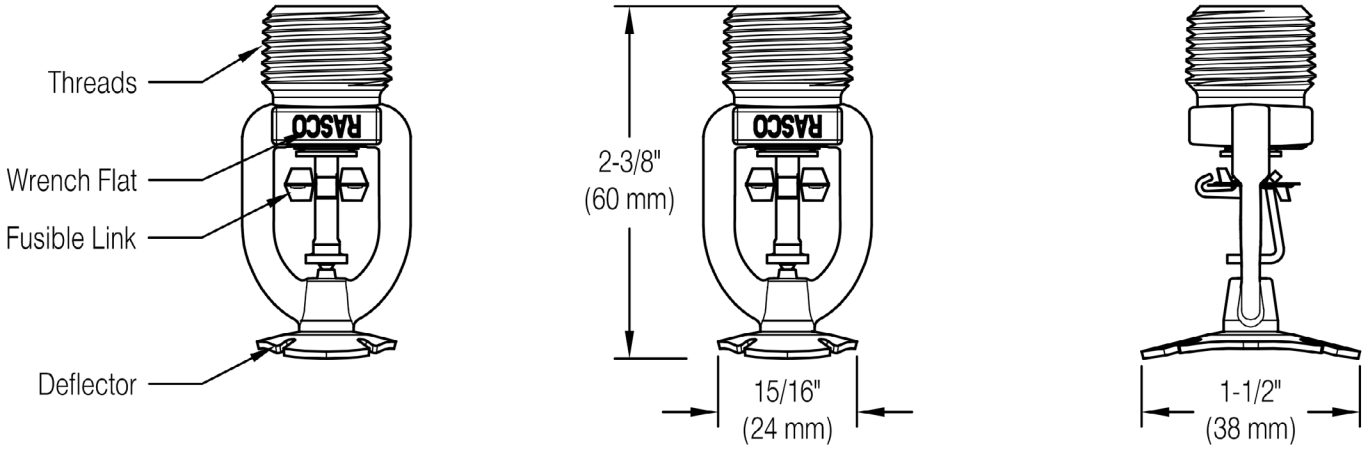
Temperature Ratings
165°F (74°C)
212°F (100°C)

Recessed Escutcheons/Cover Plates
Model FV recessed escutcheon
Model FP recessed escutcheon
Model CCP cover plate

Sprinkler Wrenches
Model W2 (pendent)
Model GFR2 (recessed and concealed)

Listings and Approvals
cULus Listed

Model LT56L-300 Sprinkler Components and Dimensions — **Figure 4**



Model LT56L-300 Sprinkler Hydraulic Design Criteria — **Table E**

Minimum Flow and Residual Pressure		
Max. Coverage Area ft. x ft. (m x m)	**Flow gpm (l/min)**	**Pressure psi (bar)**
28 x 8 (8.5 x 2.4)	23 (87)	16.9 (1.17)
28 x 10 (8.5 x 3.0)	28 (106)	25.0 (1.72)

Note: For coverage area dimensions less than or between those listed above, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.

Model LT56C Specific Application Sprinkler — SIN RA5994

Technical Specifications
Style: Flat Cover Plate Concealed Pendent
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 175 psi (12 bar)
Min. Spacing: 14 ft. (4.3 m)

Material Specifications
Thermal Sensor: Nickel Alloy Solder Link
Sprinkler Body: Brass Alloy
Levers: Bronze Alloy
Yoke: Brass Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Towers: Copper Alloy
Pins: Stainless Steel
Deflector: Bronze Alloy
Cup: Steel

Sprinkler Finishes
(See Table H)

Sensitivity
Quick-response

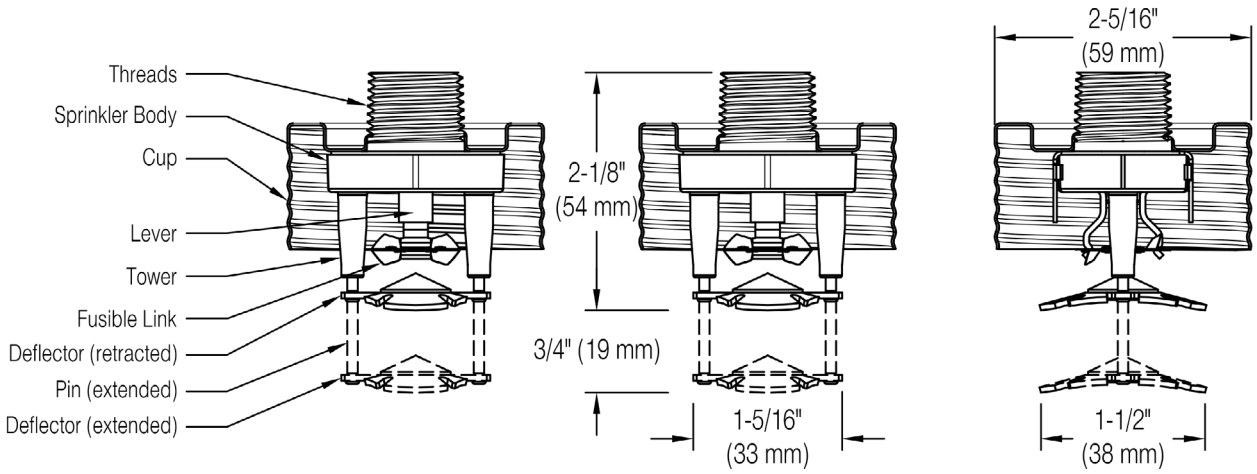
Temperature Ratings
165°F (74°C)
212°F (100°C)

Cover Plate
Model G4/G5

Sprinkler Wrench
Model FC (without wrench-able cap)
Model W3 (with wrench-able cap)

Listings and Approvals
cULus Listed

Model LT56C Sprinkler Components and Dimensions — Figure 5



Model LT56C Sprinkler Hydraulic Design Criteria — Table F

Minimum Flow and Residual Pressure		
Max. Coverage Area ft. x ft. (m x m)	**Flow gpm (l/min)**	**Pressure psi (bar)**
28 x 8 (8.5 x 2.4)	24 (91)	18.4 (1.27)
28 x 10 (8.5 x 3.0)	28 (106)	25.0 (1.72)

Note: For coverage area dimensions less than or between those listed above, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.

Recessed Escutcheon and Conical Concealed Cover Plate Dimensions

Table G

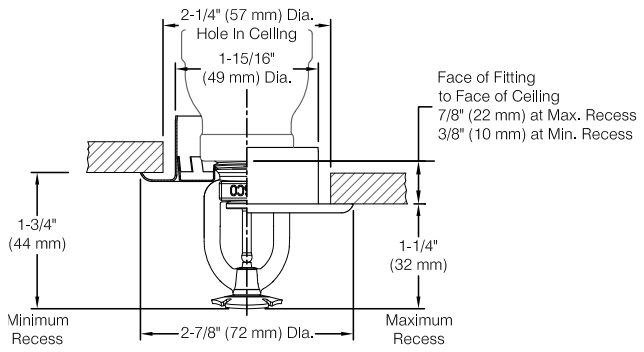
Type	Adjustment Inch (mm)	Maximum Face of Fitting to Ceiling[1] Inch (mm)	Minimum Face of Fitting to Ceiling[1] Inch (mm)	Maximum Deflector Distance Below Ceiling Inch (mm)	Minimum Deflector Distance Below Ceiling Inch (mm)	Cover Plate Temperature °F (°C)
FV	1/2 (12)	7/8 (22)	3/8 (10)	1-3/4 (44)	1-1/4 (32)	N/A
FP	1/2 (12)	1-1/2 (38)	1 (25)	1 (25)	1/2 (12)	N/A
CCP 135	1/2 (12)	1-1/2 (38)	1 (25)	1 (25)	1/2 (12)	135°F[2] (57°C)
CCP 165	1/2 (12)	1-1/2 (38)	1 (25)	1 (25)	1/2 (12)	165°F[3] (74°C)
G4/G5 135	3/4 (19)	2-1/4 (57)	1-1/2 (38)	1 (25)	1/4 (6)	135°F[2] (57°C)
G4/G5 165	3/4 (19)	2-1/4 (57)	1-1/2 (38)	1 (25)	1/4 (6)	165°F[3] (74°C)

Notes:

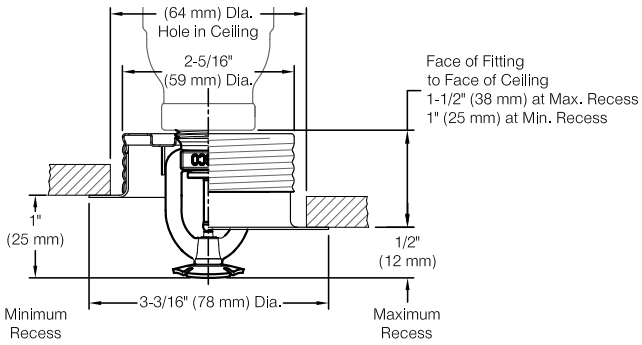
1. Face of fitting to ceiling dimensions are based on nominal thread make up. Verify dimensions based on fitting and thread sealing method prior to installation.
2. For use with 155°F (68°C) and 165°F (74°C) temperature rated sprinklers where the Maximum Ceiling Temperature does not exceed 100°F (38°C).
3. For use with 200°F (93°C) and 212°F (100°C) temperature rated sprinklers where the Maximum Ceiling Temperature does not exceed 150°F (66°C).

Recessed Escutcheon and Concealed Cover Plate Diagrams

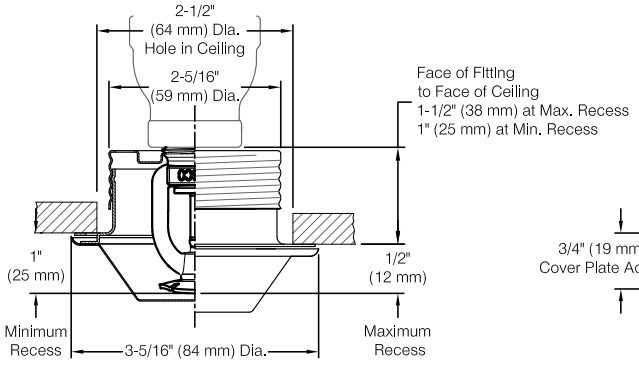
Figure 6



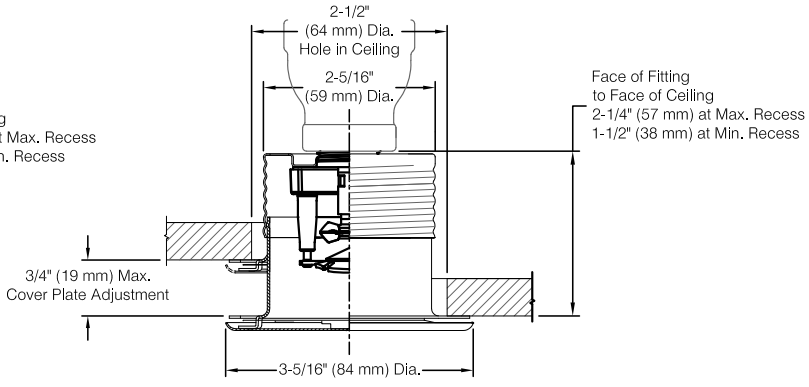
Model LT56, LT56−300, LT56L or LT56L−300 Sprinkler with Model FV Escutcheon



Model LT56, LT56−300, LT56L or LT56L−300 Sprinkler with Model FP Escutcheon



Model LT56, LT56−300, LT56L or LT56L−300 Sprinkler with Model CCP Cover Plate



Model LT56C Sprinkler with Model G4/G5 Cover Plate

Application

Model LT56 series sprinklers are cULus Listed Specific Application sprinklers for use in Light Hazard corridors and hallways in accordance with NFPA 13. The sprinklers are classified as Special Sprinklers based on the maximum and minimum allowable spacing, but shall otherwise be designed in accordance with the requirements of NFPA 13 for Extended Coverage Pendent Spray sprinklers. Model LT56 series sprinklers are quick-response sprinklers for use in Light Hazard occupancies only.

The sprinklers must be hydraulically designed using the minimum flow and pressure specified in the Hydraulic Design Criteria tables in this Bulletin. Figure 7 outlines the maximum coverage area of Model LT56 series sprinklers. Figure 8 identifies the sprinklers that can be located adjacent to Model LT56 series sprinklers; note that LT56 series sprinkler are not permitted to be installed with the short coverage length oriented towards the short coverage length of an adjacent LT56 series sprinkler. An example layout of Model LT56 series sprinklers is illustrated in Figure 9.

Listings and Approvals

Listed by Underwriters Laboratories, Inc. and UL Certified for Canada (cULus)

UL Listing Category

Sprinklers, Automatic and Open

UL Guide Number

VNIV

Installation

Model LT56 series sprinklers must be installed in accordance with the requirements of the NFPA 13 for pendent sprinklers and may also be installed as a recessed sprinkler or concealed sprinkler as shown in Figure 6. The Model FV and FP recessed escutcheons, and Model CCP cover plate, are the only recessed escutcheons and concealed cover plate to be used with Model LT56, LT56L, LT56-300 and LT56L-300 sprinklers. The Model G4/G5 cover plate is the only concealed cover plate permitted for use with the Model LT56C sprinkler. Use of any other recessed escutcheon or cover plate will void all approvals and warranties. Do not install Model FV and FP escutcheons or Model CCP and G4/G5 cover plates in ceilings that are positively pressurized with respect to the occupied space below.

When installing Model LT56, LT56L, LT56-300, and LT56L-300 sprinklers use only the Model W2 wrench for pendent installations and the Model GFR2 wrench for recessed pendent and concealed installation. The Model LT56C sprinkler must be installed with the W3 or FC wrench only. Use of wrenches other than those specified may damage these sprinklers.

Model LT56C series sprinklers can be installed without removing the wrench-able protective cap using the Model W3 wrench. Alternatively, Model LT56C series sprinklers can be installed using the Model FC wrench by temporarily removing the protective cap during installation of the sprinkler. The use of any other wrench to installed Model LT56C series sprinklers is not permitted and may damage the sprinkler. Fully insert the Model W3 wrench over the cap until it reaches the bottom of the cup, or the Model FC wrench over the sprinkler until the wrench engages the body. Do not wrench any other part of the sprinkler/cup assembly. The Model W3 and FC wrenches are designed to be turned with a standard 1/2" square drive. Tighten the sprinkler into the fitting after applying a PTFE based thread sealant to the sprinkler's threads. Recommended installation torque is 8 to 18 ft-lbs (11 to 24 N-m) for 1/2" thread sprinklers and 14 to 20 ft-lbs (19 to 27 N-m) for 3/4" thread sprinklers.

Model LT56 series sprinklers must be installed with the frame arms or towers perpendicular to the length of the corridor or hallway. The deflector is marked with "<-28 FT->" to indicate the direction of the 28 ft. (8.5 m) coverage length. Model LT56 series sprinklers need not be installed with the frame arms or towers parallel to the sprinkler pipe.

Caution: The protective cap provided with the Model LT56C concealed sprinkler must be removed temporarily to verify alignment at the time of sprinkler rough-in. Replace protective cap following alignment and leave in place until cover plate is installed.

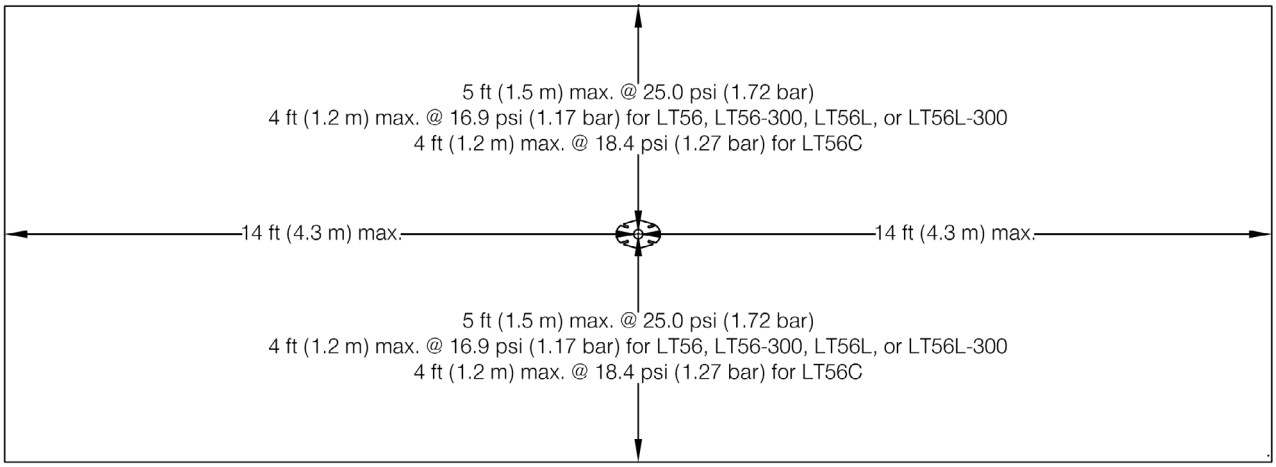
Recommended installation torque is 8-18 ft-lbs (11 – 24 N-m). Do not tighten sprinklers over the maximum recommended torque. Exceeding the maximum recommended torque may cause leakage or impairment of the sprinklers.

Do not install any glass bulb sprinklers where the bulb is cracked or there is a loss of liquid from the bulb.

Glass bulb sprinklers have orange bulb protectors to minimize bulb damage during shipping, handling and installation. Remove the bulb protector at the time the sprinkler system is placed in service for fire protection. Removal of the bulb protectors before this time may leave the bulb vulnerable to damage. The required sprinkler wrenches are designed to install sprinklers with bulb protectors in place. Remove bulb protectors by undoing the clasp by hand. Do not use tools to remove the bulb protectors.

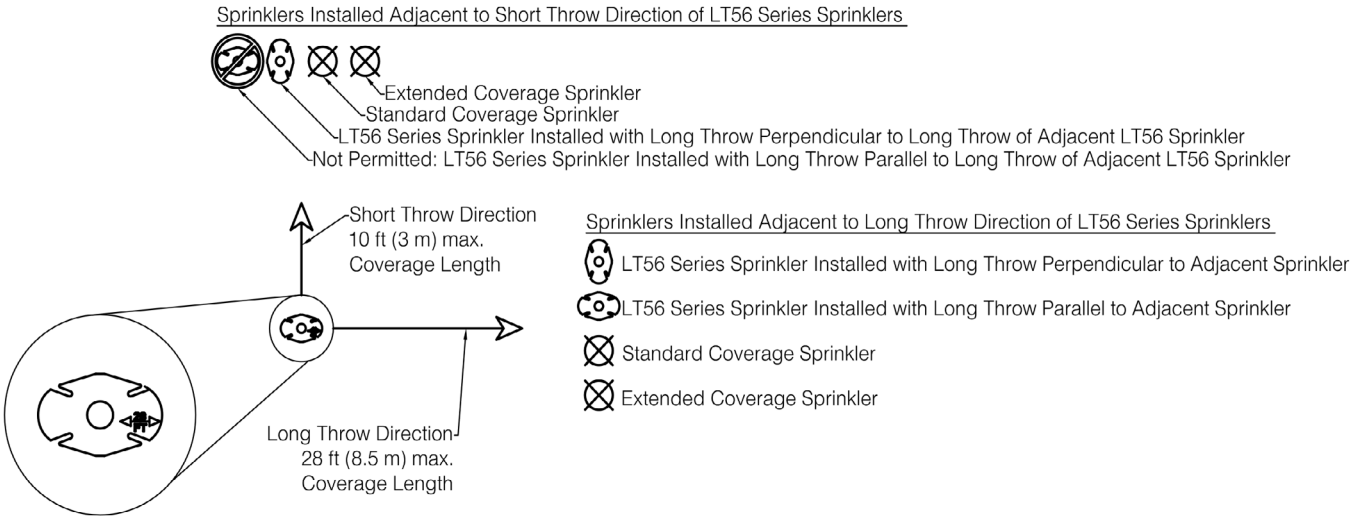
Coverage Area

Figure 7



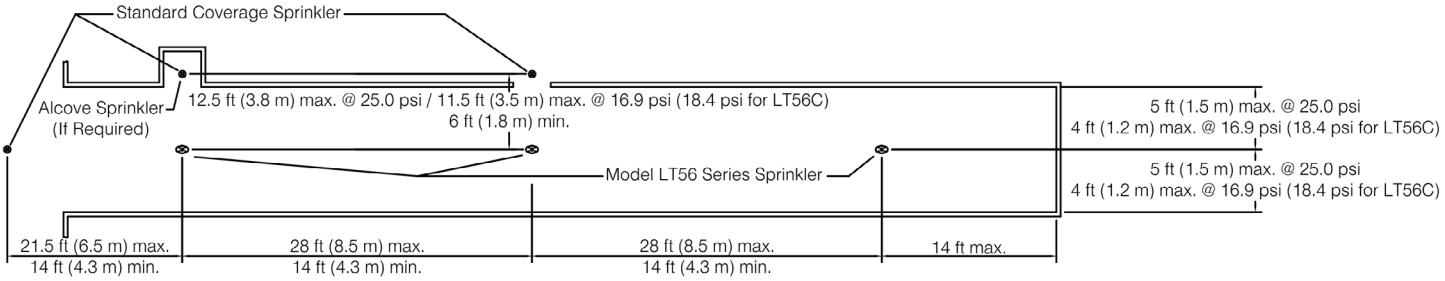
Adjacent Sprinklers

Figure 8



Example Sprinkler Layout

Figure 9



Wrench

Model FC
For use with Model LT56C Series sprinklers without wrench-able cap installed

Model W3
For use with Model LT56C Series sprinklers with wrench-able cap installed

Sprinkler, Escutcheon, & Cover Plate Finishes[2] — **Table H**

Standard Finishes			Special Application Finishes		
Sprinkler[1]	**FV, FP[4] Escutcheons**	**CCP, G4/G5 Cover Plate**	**Sprinkler**	**FV, FP[3] Escutcheons**	**CCP, G4/G5 Cover Plate**
Bronze	Brass		Bright Brass	Bright Brass	Bright Brass
Chrome Plated	Chrome Plated	Chrome Plated	Dull Chrome	Dull Chrome	Chrome Dull
White Polyester[3]	White Polyester	White Paint	Black Polyester[3]	Black Polyester	Black Paint
			Custom Color Polyester	Custom Color Polyester	Custom Color Paint
			Electroless Nickel PTFE[3]	Electroless Nickel PTFE	

Notes:
1. Model LT56, LT56L, LT56-300, and LT56L-300 only.
2. Paint or any other coating applied over the factory finish will void all approvals and warranties.
3. cULus Listed Corrosion Resistant, Models LT56 (RA5814) and LT56-300 (RA5914) only.
4. The Model FP escutcheon assembly consists of an unfinished galvanized cup with a finished escutcheon ring.

Maintenance

Reliable Model LT56 series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). Properly installed Model CCP and Model G4/G5 cover plates will have an air gap that is required for proper operation, do not seal the gap or paint the cover plates. Model FV and FP escutcheons as well as Model CCP and Model G4/G5 cover plates have holes in the ring or cup that must remain unobstructed.

Replace any sprinkler which has been damaged, cracked the glass bulb, or has lost liquid from the glass bulb. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Patents

Patent Pending

Ordering Information

Specify the following when ordering:

Sprinkler
- Model (LT56, LT56L, LT56-300, LT56L-300, LT56C)
- Temperature Rating
- Threads (1/2" NPT or ISO 7-1 R1/2)
- Finish (See Table H)

Escutcheon or Cover Plate
- Type (None, FV, FP, CCP, G4/G5)
- Finish (See Table H)

Sprinkler Wrench
- Pendent: Model W2 Wrench
- Recessed Pendent & Conical Concealed: Model GFR2 Wrench
- Flat Concealed Pendent:
  - Model W3 Wrench (with wrench-able cap)
  - Model FC Wrench (without wrench-able cap)