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Series LFII Residential 4.9 K-factor Polymeric Concealed Pendent Sprinkler Flat Plate

IMPORTANT

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

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

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General Description

The TYCO Lead-Free Series LFII Residential 4.9 K-factor Flat Plate Concealed Pendent Sprinkler (TY3534) is a decorative, glass bulb sprinkler. They are designed for use in residential occupancies such as homes, apartments, dormitories, and hotels.

The sprinkler is available in the following temperature rated configurations:

- Ordinary 155°F (68°C)
- Intermediate 200°F (93°C)

The cover plate assembly conceals the sprinkler operating components above the ceiling. The flat profile of the cover plate provides the optimum aesthetically appealing sprinkler design. In addition, the concealed design of the sprinkler provides 3/4 in. (19.1 mm) vertical adjustment. This adjustment provides a measure of flexibility when cutting fixed sprinkler drops.

The sprinklers are intended for use in wet pipe residential systems in accordance with any of the following NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) standards:

- NFPA 13
- NFPA 13R
- NFPA 13D

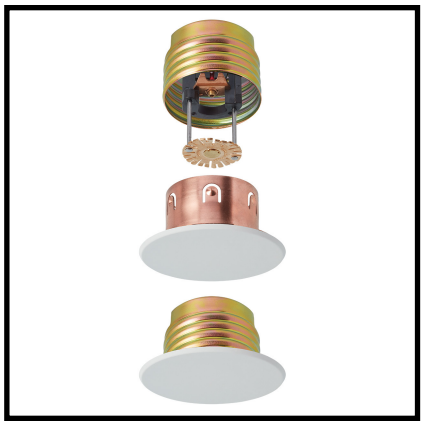
Note: *The sprinklers must be attached to plastic sprinkler pipe and fittings.*

The sprinkler is designed with heat sensitivity and water distribution characteristics proven to help in the control of residential fires and to improve the chance for occupants to escape or be evacuated.

Each sprinkler is shipped with a disposable protective cap. The protective cap is temporarily removed for installation, and then it can be replaced to help protect the sprinkler while the ceiling is being installed or finished. The tip of the protective cap can also be used to mark the center of the ceiling hole into the plaster board, ceiling tiles, and so on, by gently pushing the ceiling product against the protective cap. When the ceiling installation is complete the protective cap is removed and the cover plate assembly is installed.

NOTICE

The TYCO Lead-Free Series LFII Residential 4.9 K-factor Flat Plate Concealed Pendent Sprinkler (TY3534) described herein must be installed and maintained in compliance with this document and with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA),



NSF Certified to NSF/ANSI 61 & 372

in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of these devices.

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

NOTICE

The TYCO Lead-Free Series LFII Residential 4.9 K-factor Flat Plate Concealed Pendent Sprinkler (TY3534) must be installed in a gasket-sealed sprinkler head adapter plastic fitting which does not require thread sealant or tape. Use with all other fittings is prohibited.

Sprinkler Identification Number (SIN)

TY3534

Maximum Coverage Area [1] ft x ft (m x m)	Maximum Spacing ft (m)	Temperature Rating	Wet Pipe System Minimum Flow and Residual Pressure [2, 3]				
			Flow gpm (Lpm)	Pressure psi (bar)	Deflector-to-Ceiling Distance	Installation Type	Minimum Spacing ft (m)
12 x 12 (3,7 x 3,7)	12 (3,7)	155°F (68°C), 200°F (93°C)	13 (49,2)	7.0 (0,48)	Smooth Ceilings: 1/2 in. to 1 1/4 in. Beamed Ceilings: per NFPA 13D, 13R, or 13, installed in beam 1/2 in. to 1 1/4 in. below bottom of beam	Concealed	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)		13 (49,2)	7.0 (0,48)			
16 x 16 (4,9 x 4,9)	16 (4,9)		13 (49,2)	7.0 (0,48)			
18 x 18 (5,5 x 5,5)	18 (5,5)		17 (63,5)	12.0 (0,83)			
20 x 20 (6,1 x 6,1)	20 (6,1)		20 (75,7)	16.7 (1,15)			

Notes:
1. For coverage area dimensions less than or between those indicated, use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.
2. Requirement is based on minimum flow in gpm (Lpm) from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. See Hydraulic Design under the Design Criteria section.
3. For NFPA 13 residential applications, the greater of 0.1 gpm/ft² over the design area or the flow in accordance with the criteria in this table must be used.

TABLE A
LEAD-FREE SERIES LFII RESIDENTIAL 4.9 K-FACTOR
FLAT PLATE CONCEALED PENDENT SPRINKLER (TY3534)
WET PIPE SYSTEM NFPA 13D, 13R, OR 13 HYDRAULIC DESIGN CRITERIA

Technical Data

Approvals
UL and C-UL Listed
Certified to all requirements of
NSF/ANSI 61
NSF/ANSI 372 - Lead-Free

Note: *The TYCO Lead-Free Series LFII Residential 4.9 K-factor Flat Plate Concealed Pendent Sprinkler is listed only when installed with LFII Concealed Cover Plates having factory-applied finishes.*

Note: *Sprinklers and cover plates are separately ordered. See the Ordering Procedure section for more information.*

Note: *The TYCO Lead-Free Series LFII Residential 4.9 K-factor Flat Plate Concealed Pendent Sprinkler is listed for use with Tyco LFP Antifreeze and Tyco LFP Antifreeze+. See TFP1680 and TFP1682 for application details, hydraulic calculation procedures and limitations.*

Maximum Working Pressure
175 psi (12,1 bar)

Discharge Coefficient
K=4.9 gpm/psi^{½} (70,6 Lpm/bar^{½})

Temperature Rating
Ordinary*
155°F (68°C) Sprinkler/
139°F (59°C) Cover Plate
*For wet pipe systems only

Note: *Maximum Ambient Ceiling Temperature for the ordinary temperature configuration is 100°F (38°C)*

Intermediate*
200°F (93°C) Sprinkler/
165°F (74°C) Cover Plate
*For wet pipe systems only

Note: *Maximum Ambient Ceiling Temperature for the intermediate temperature configuration is 150°F (65°C)*

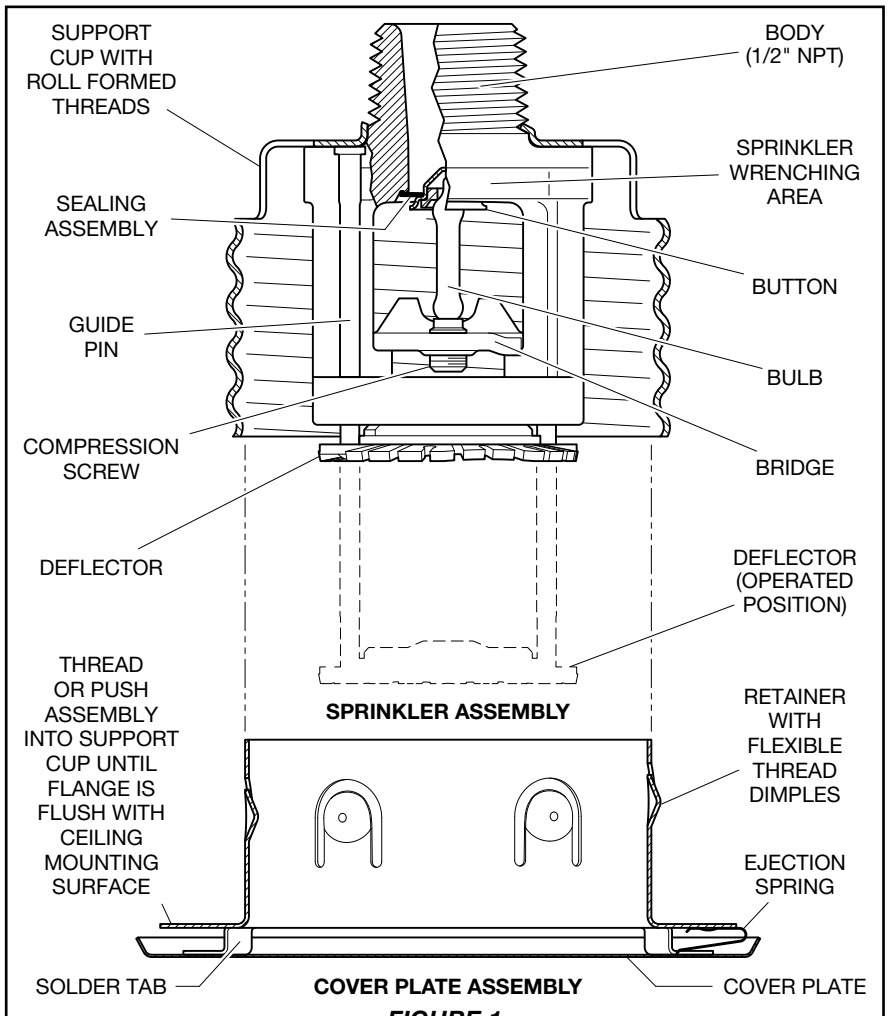


FIGURE 1
LEAD-FREE SERIES LFII RESIDENTIAL 4.9 K-FACTOR
FLAT PLATE CONCEALED PENDENT SPRINKLER (TY3534)

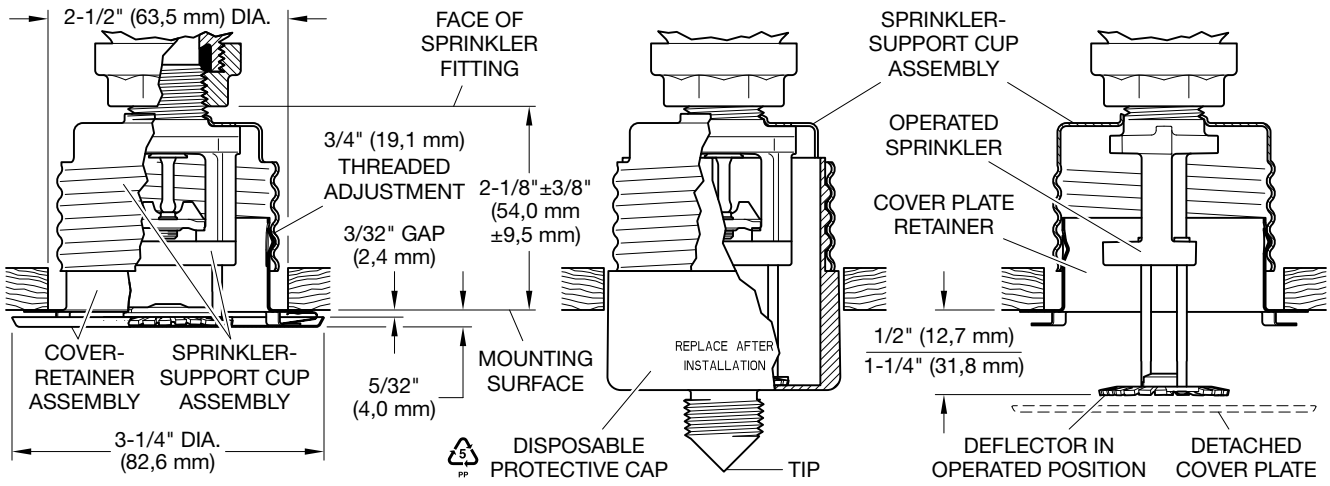


FIGURE 2
LEAD-FREE SERIES LFII RESIDENTIAL 4.9 K-FACTOR
FLAT PLATE CONCEALED PENDENT SPRINKLER (TY3534)
INSTALLATION DIMENSIONS, PROTECTIVE CAP, AND ACTIVATED DEFLECTOR

Vertical Adjustment
3/4 in. (19,1 mm)

Finishes
See the Ordering Procedure section

Physical Characteristics

Body	PPS*
Button	Copper
Button Insert	Bronze
Sealing Assembly	Beryllium Nickel w/TEFLON
Compression Screw	Brass
Bulb	Glass
Deflector	Bronze
Guide Pins	Stainless Steel
Support Cup	Steel
Cover Plate	Brass
Retainer	Plated Steel/Brass
Cover Plate Ejection Spring	Stainless Steel
Bridge	Bronze

* PPS= Polyphenylene sulfide

Operation

When exposed to heat from a fire, the cover plate, which is normally soldered to the retainer at three points, falls away to expose the sprinkler assembly. At this point the deflector supported by the guide pins drops down to its operated position.

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

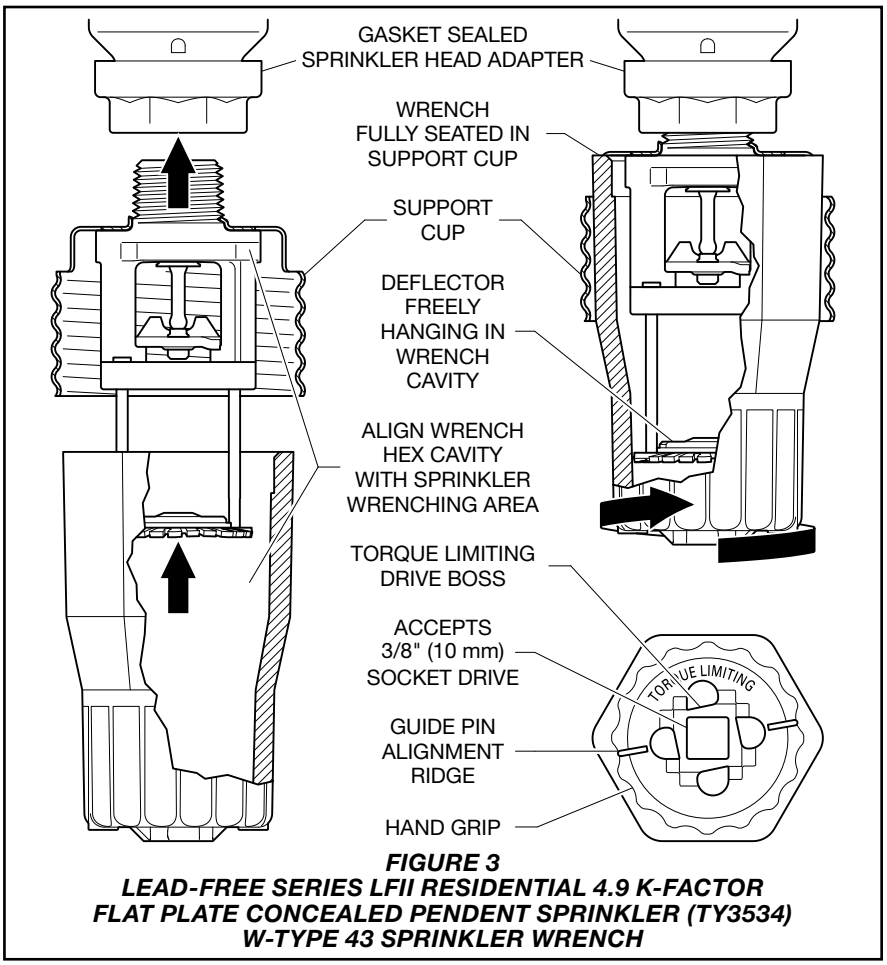


FIGURE 3
LEAD-FREE SERIES LFII RESIDENTIAL 4.9 K-FACTOR
FLAT PLATE CONCEALED PENDENT SPRINKLER (TY3534)
W-TYPE 43 SPRINKLER WRENCH

Design Criteria

The TYCO Lead-Free Series LFII Residential 4.9 K-factor Flat Plate Concealed Pendent Sprinkler (TY3534) is UL and C-UL Listed for installation in accordance with this section.

Note: *When conditions exist that are outside the scope of the provided criteria, refer to the Residential Sprinkler Design Guide TFP490 for the manufacturer's recommendations that may be acceptable to the authority having jurisdiction.*

System Types
According to the UL and C-UL Listing, the system types and the approved sprinkler temperature rated configurations are as follows:

- **System Material**
  Plastic pipe and fittings only
- **Wet Pipe Systems**
  Ordinary Temperature Rating, 155°F (68°C)
  Intermediate Temperature Rating, 200°F (93°C)

Ceiling Types
Smooth flat horizontal, beamed, or sloped in accordance with NFPA 13D, 13R, or 13.

Hydraulic Design (NFPA 13D and 13R)
For systems designed to NFPA 13D and 13R the minimum required sprinkler flow rates are given in Table A as a function of temperature rating and the maximum allowable coverage areas.

The sprinkler flow rate is the minimum required discharge from each of the total number of "design sprinklers" as specified in NFPA 13D and 13R.

Hydraulic Design (NFPA 13)
For systems designed to NFPA 13, the number of design sprinklers is to be the four most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklersis to be the greater of the following:

- Flow rates given in Table A as a function of temperature rating and the maximum allowable coverage area
- Minimum discharge of 0.1 gpm/ft² over the design area comprised of the four most hydraulically demanding sprinklers for actual coverage areas protected by the four sprinklers

Obstruction to Water Distribution
Sprinklers are to be located in accordance with the obstruction rules of NFPA 13D, 13R, and 13 for residential sprinklers as well as with the obstruction criteria described within the Technical Data Sheet TFP490.

Operational Sensitivity
The sprinklers are to be installed relative to the ceiling mounting surface as shown in Figure 2.

Sprinkler Spacing
The minimum spacing between sprinklers is 8 ft (2,4 m). The maximum spacing between sprinklers cannot exceed the length of the coverage area (see Table A) being hydraulically calculated, for example, maximum 12 ft (3,6 m) for a 12 ft x 12 ft (3,6 m x 3,6 m) coverage area, or 20 ft (6,1 m) for a 20 ft x 20 ft (6,1 m x 6,1 m) coverage area.

The sprinkler must not be used in applications where the air pressure above the ceiling is greater than that below. Down drafts through the support cup could delay sprinkler operation in a fire situation.

Installation

The TYCO Lead-Free Series LFII Residential 4.9 K-factor Flat Plate Concealed Pendent Sprinkler (TY3534) must be installed in accordance with this section.

General Instructions
Observe the following guidelines while installing the sprinkler:

NOTICE

The TYCO Lead-Free Series LFII Residential 4.9 K-factor Flat Plate Concealed Pendent Sprinkler (TY3534) must be installed in a gasket-sealed sprinkler head adapter plastic fitting that does not require thread sealant or tape. Use with all other fittings is prohibited.

- To avoid damaging the glass bulb during installation, handle the sprinkler by the support cup only. Do not apply pressure to the glass bulb.
- The sprinkler is restricted to use with a gasket-sealed sprinkler head adapter plastic fitting that does not require thread sealant or tape.
- Do not attempt to compensate for insufficient adjustment in the cover plate assembly by under- or over-tightening the sprinkler. Readjust the position of the sprinkler fitting to suit.

Installing the Sprinkler
Step 1. The sprinkler must only be installed in the pendent position and with the centerline of the sprinkler perpendicular to the mounting surface.

Step 2. Remove the protective cap.

Step 3. Ensure the sprinkler threads are clean and do not have thread sealant such as tape or paste applied. Avoiding cross-threading, gently thread the sprinkler into the fitting and hand tighten until the sprinkler makes contact with the gasket.

Step 4. Orient the sprinkler as needed by applying the W-Type 43 wrench as shown in Figure 3 to the sprinkler wrench flats, and tighten up to an additional full turn, or by applying up to a maximum torque of 7 lb-ft (9,5 N·m).

Note: *The TYCO Lead-Free Series LFII Residential 4.9 K-factor Flat Plate Concealed Pendent Sprinkler (TY3534) Wrench is designed to limit the maximum installation torque and break at excessively high torque. In the event that the wrench breaks, the sprinkler should be inspected. A new wrench should be used to remove the sprinkler.*

Note: *There are two ridges on the top of the W-Type 43 wrench that can be used for reference when aligning the sprinkler guide pins with the pipe.*

Step 5. Replace the protective cap by pushing it upwards until it bottoms out against the support cup. The protective cap helps prevent damage to the deflector and guide pins during ceiling installation and/or during application of the finish coating of the ceiling. It may also be used to locate the center of the clearance hole by gently pushing the ceiling material against the center point of the cap.

Note: *As long as the protective cap remains in place, the system is considered to be "Out Of Service."*

Step 6. After the ceiling has been completed with the 2-1/2 in. (63 mm) diameter clearance hole and in preparation for installing the cover plate assembly, remove and discard the protective cap, and verify that the deflector falls to fully operated position under its own weight.

If the sprinkler is damaged and the deflector does not fall under its own weight, replace the entire sprinkler assembly. Do not attempt to modify or repair a damaged sprinkler.

Step 7. Push on the cover plate assembly, and rotate as needed, until its flange comes in contact with the ceiling.

Do not continue to push on the cover plate assembly such that it lifts a ceiling panel out of its normal position.

If the cover plate assembly cannot be engaged with the mounting cup or the cover plate assembly cannot be engaged sufficiently to contact the ceiling, the sprinkler fitting must be repositioned.

Care and Maintenance

The TYCO Lead-Free Series LFII Residential 4.9 K-factor Flat Plate Concealed Pendent Sprinkler (TY3534) must be maintained and serviced in accordance with this section.

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

Absence of a cover plate may delay the sprinkler operation in a fire situation.

When properly installed, there is an air gap between the lip of the cover plate and the ceiling. The cover plate has a nominal 3/32 (2,4 mm) air gap, as shown in Figure 2. This air gap is necessary for proper operation of the sprinkler by allowing heat flow from a fire to pass below and above the cover plate to help assure appropriate release of the cover plate in a fire situation. If the ceiling is to be repainted after the installation of the sprinkler, care must be exercised to ensure that the new paint does not seal off any of the air gap.

Factory painted cover plates must not be repainted. They should be replaced, if necessary, by factory painted units. Non-factory applied paint may adversely delay or prevent sprinkler operation in the event of a fire.

Do not pull the cover plate relative to the enclosure. Separation may result.

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

Automatic sprinklers must never be painted, plated, coated, or otherwise altered after leaving the factory. Modified or over heated sprinklers must be replaced.

Care must be exercised to avoid damage before, during, and after installation. Sprinklers damaged by dropping, striking, wrench twist/slippage, or the like, must be replaced.

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

The owner must assure that the sprinklers are not used for hanging any objects and that the sprinklers are only cleaned by means of gently dusting with a feather duster; otherwise, non-operation in the event of a fire or inadvertent operation may result.

Automatic sprinkler systems should be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

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

Sprinkler Assemblies
Specify: Series LFII (TY3534) 4.9K Residential Concealed Pendent Sprinkler, Temperature Rating (specify), P/N (specify):

155°F (68°C) (Ordinary) 50-451-1-155
200°F (93°C) (Intermediate) 50-451-1-200

Note: *Sprinkler and Cover Plates are separately sold. See below for Cover Plate ordering information.*

Cover Plate Assemblies
Specify: Series LFII Concealed Sprinkler Cover Plate Assembly, temperature rating (specify), finish (specify), P/N (specify):

139°F (59°C)
Ivory (RAL1015) 56-891-0-135
Bright Brass 56-891-1-135B
Beige (RAL1001). 56-891-2-135
Pure White (RAL9010)*. 56-891-3-135
Signal White (RAL9003)** 56-891-4-135
Grey White (RAL9002) 56-891-5-135
Brown (RAL8028). 56-891-6-135
Black (RAL9005) 56-891-7-135
Brushed Brass 56-891-8-135
Brushed Chrome 56-891-9-135
Bright Chrome 56-891-9-135B
Custom Paint 56-891-X-135

165°F (74°C)
Ivory (RAL1015) 56-891-0-165
Bright Brass 56-891-1-165B
Beige (RAL1001). 56-891-2-165
Pure White (RAL9010)*. 56-891-3-165
Signal White (RAL9003)** 56-891-4-165
Grey White (RAL9002) 56-891-5-165
Brown (RAL8028). 56-891-6-165
Black (RAL9005) 56-891-7-165
Brushed Brass 56-891-8-165
Brushed Chrome 56-891-9-165
Bright Chrome 56-891-9-165B
Custom Paint 56-891-X-165

*Eastern Hemisphere sales only
**Previously known as Bright White

Note: *All Custom Cover Plates are painted using SHERWIN-WILLIAMS Interior Latex Paint. Contact Johnson Controls Customer Service with any questions related to custom orders.*

Sprinkler Wrench
Specify: W-Type 43 Sprinkler Wrench, P/N 56-000-1-078

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