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Model TY-FRFS, TY-FS Special, and TY-FS 57, 80, and 115 K-factor Upright and Pendent Flat Spray Sprinklers

IMPORTANT

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

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

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docs.jci.com/tycofire/TFP635

General Description

The Model TY-FRFS, TY-FS Special, and TY-FS, Upright and Pendent, Flat Spray Sprinklers are intended for installation in accordance with CEA 4001 Sprinkler Systems Planning and Installation or EN12845 Automatic Sprinkler Systems – Design, Installation and Maintenance, as applicable. They produce a flatter spray pattern than standard spray sprinklers, enabling them to be used with lower clearance above the suspended open ceilings and in racks.

As necessary the K80 and K115, Flat Spray Sprinklers may be outfitted with guards, shields, or guards with shields. The guards may be used in areas that make the sprinklers susceptible to mechanical or physical damage, whereas the shields may be used to help prevent the sprinklers from being wetted (cold soldered) from water spray of higher elevation sprinklers. Table A provides a detailed matrix of the allowable combinations.

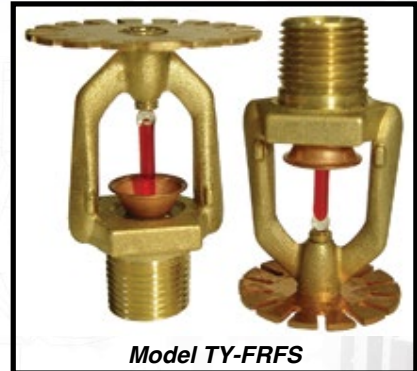
The Model TY-FRFS with its 3 mm diameter heat sensitive bulb element is rated quick response, the Model TYFS Special with its 4 mm diameter heat-sensitive bulb element is rated special response, and the Model TY-FS with its 5 mm diameter heat sensitive bulb element is rated standard response "A."

CEA 4001 Sprinkler Systems Planning and Installation and EN12845 Automatic Sprinkler Systems – Design, Installation and Maintenance permits flat spray sprinklers to be used in concealed spaces, suspended open ceilings, and in racks.

NOTICE

Model TY-FRFS, TY-FS Special, and TY-FS Sprinklers, as well as guard/shield accessories, described herein must be installed and maintained in compliance with this document, as well as with the applicable standards recognized by the approval agency, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

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



Model TY-FRFS



Model TY-FS Special



Model TY-FS

Series	Bulb Size	Orifice	Position	SIN	Approvals	Guard	Shield	Guard/Shield
TY-FRFS	3 mm	K57, 10 mm	Upright	TY1136	1, 2	N/A	N/A	N/A
TY-FS Special	4 mm			TY1146	1	N/A	N/A	N/A
TY-FS	5 mm			TY1156	1, 2	N/A	N/A	N/A
TY-FRFS	3 mm		Pendent	TY1236	1, 2, 4	N/A	N/A	N/A
TY-FS Special	4 mm			TY1246	1	N/A	N/A	N/A
TY-FS	5 mm			TY1256	1, 2	N/A	N/A	N/A
TY-FRFS	3 mm	K80, 15 mm	Upright	TY3136	1, 2, 3	G1	N/A	N/A
TY-FS Special	4 mm			TY3146	1, 3	G1	N/A	N/A
TY-FS	5 mm			TY3156	1, 2, 3	G1	N/A	N/A
TY-FRFS	3 mm		Pendent	TY3236	1, 2, 3, 4	G1	H1 or H2	G1/H1 or G1/H2
TY-FS Special	4 mm			TY3246	1, 3	G1	H1 or H2	G1/H1 or G1/H2
TY-FS	5 mm			TY3256	1, 3	G1	H1 or H2	G1/H1 or G1/H2
TY-FRFS	3 mm	K115, 20 mm	Upright	TY4136	1, 2, 3	G1	N/A	N/A
TY-FS Special	4 mm			TY4146	1, 3	G1	N/A	N/A
TY-FS	5 mm			TY4156	1, 3	G1	N/A	N/A
TY-FRFS	3 mm		Pendent	TY4236	1, 3, 4	G1	H1 or H2	G1/H1 or G1/H2
TY-FS Special	4 mm			TY4246	1, 3	G1	H1 or H2	G1/H1 or G1/H2
TY-FS	5 mm			TY4256	1, 3	G1	H1 or H2	G1/H1 or G1/H2

NOTES:
 1. VdS Approved
 2. LPCB Approved
 3. CEA 4001 / EN12845 Approved
 4. EAC Approved

TABLE A
ALLOWABLE COMBINATIONS OF GUARDS, SHIELDS AND GUARDS WITH SHIELDS
AND LABORATORY LISTINGS AND APPROVALS

Sprinkler Identification Numbers (SINs)

Model TY-FRFS (3 mm Bulb)

TY1136 – Upright K57
 TY1236 – Pendant K57
 TY3136 – Upright K80
 TY3236 – Pendant K80
 TY4136 – Upright K115
 TY4236 – Pendant K115

Model TY-FS Special (4 mm Bulb)

TY1146 – Upright K57
 TY1246 – Pendant K57
 TY3146 – Upright K80
 TY3246 – Pendant K80
 TY4146 – Upright K115
 TY4246 – Pendant K115

Model TY-FS (5 mm Bulb)

TY1156 – Upright K57
 TY1256 – Pendant K57
 TY3156 – Upright K80
 TY3256 – Pendant K80
 TY4156 – Upright K115
 TY4256 – Pendant K115

Operation

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.

Technical Data

Approvals

Guards are accepted for installation per CEA 4001 *Sprinkler Systems Planning and Installation* or EN12845 *Automatic Sprinkler Systems – Design, Installation, and Maintenance*

For details contact:
 Johnson Controls
 Enschede, Netherlands
 Tel. 31-53-428-4444
 Fax 31-53-428-3377

VdS Approved
 LPCB Approved
 EAC Approved

Maximum Working Pressure

12,1 bar

Discharge Coefficient

K=57 Lpm/bar^{1/2}
 K=80 Lpm/bar^{1/2}
 K=115 Lpm/bar^{1/2}

Temperature Ratings (°C)

57, 68, 79, 93, and 141

Finishes

Sprinklers: Natural Brass
 Guards: Red Painted / Zinc Chromate
 Shields: Zinc Chromate

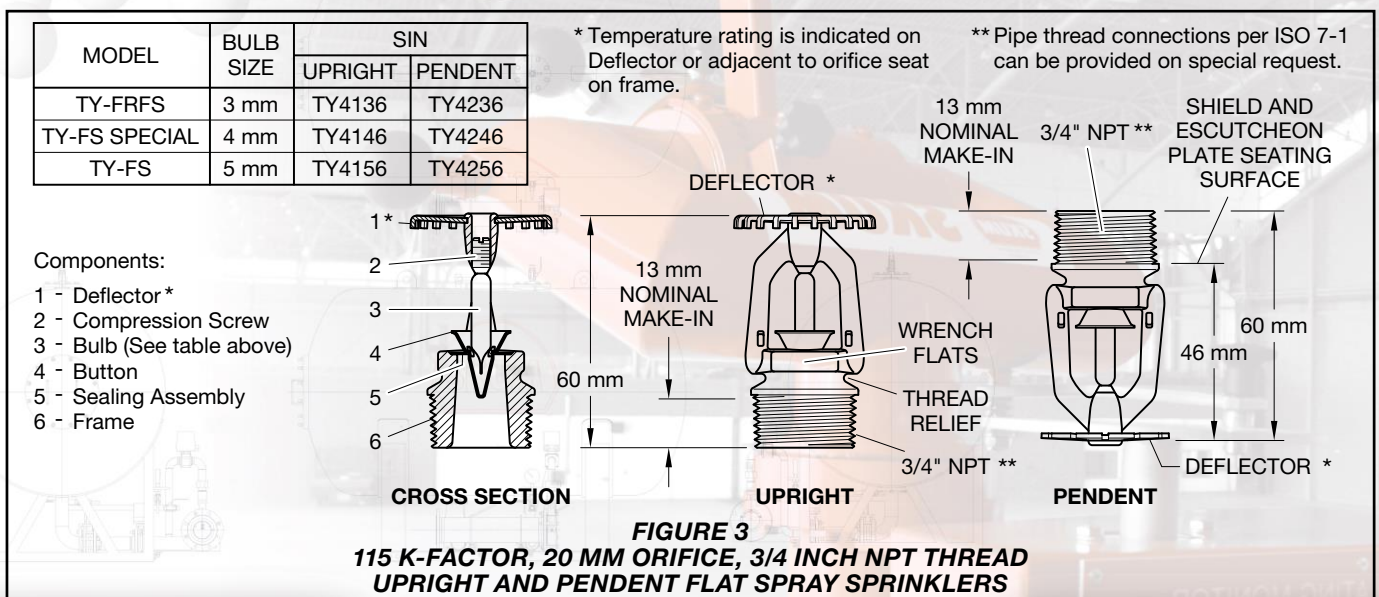
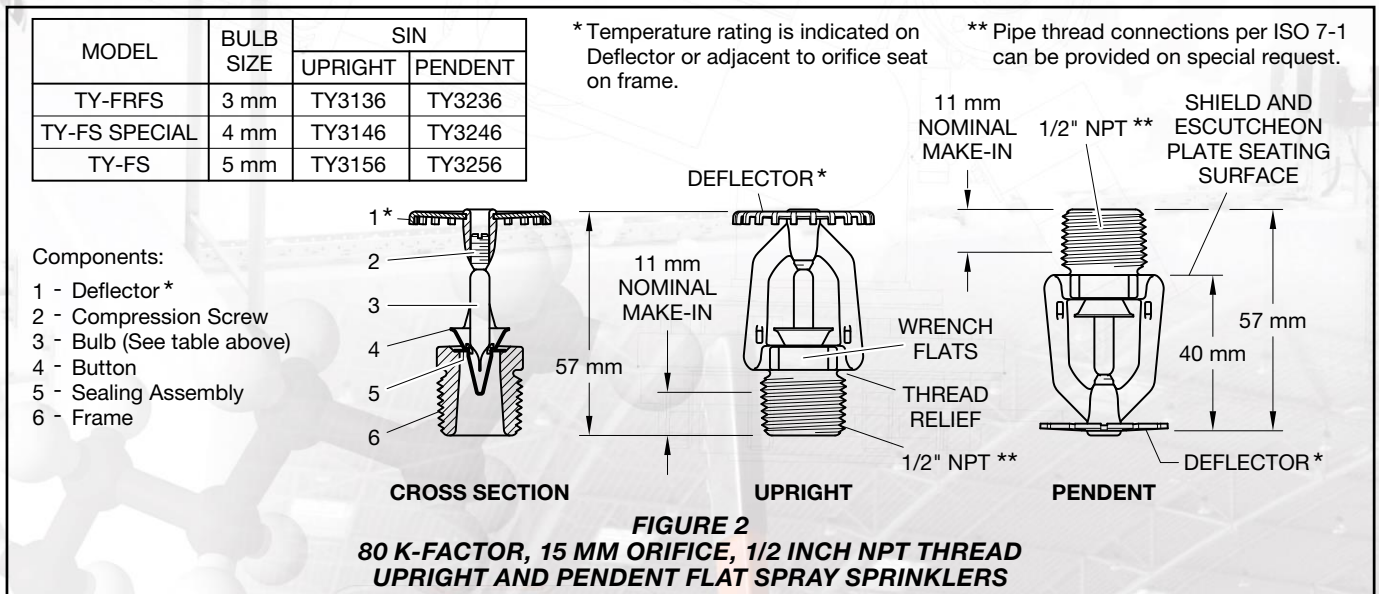
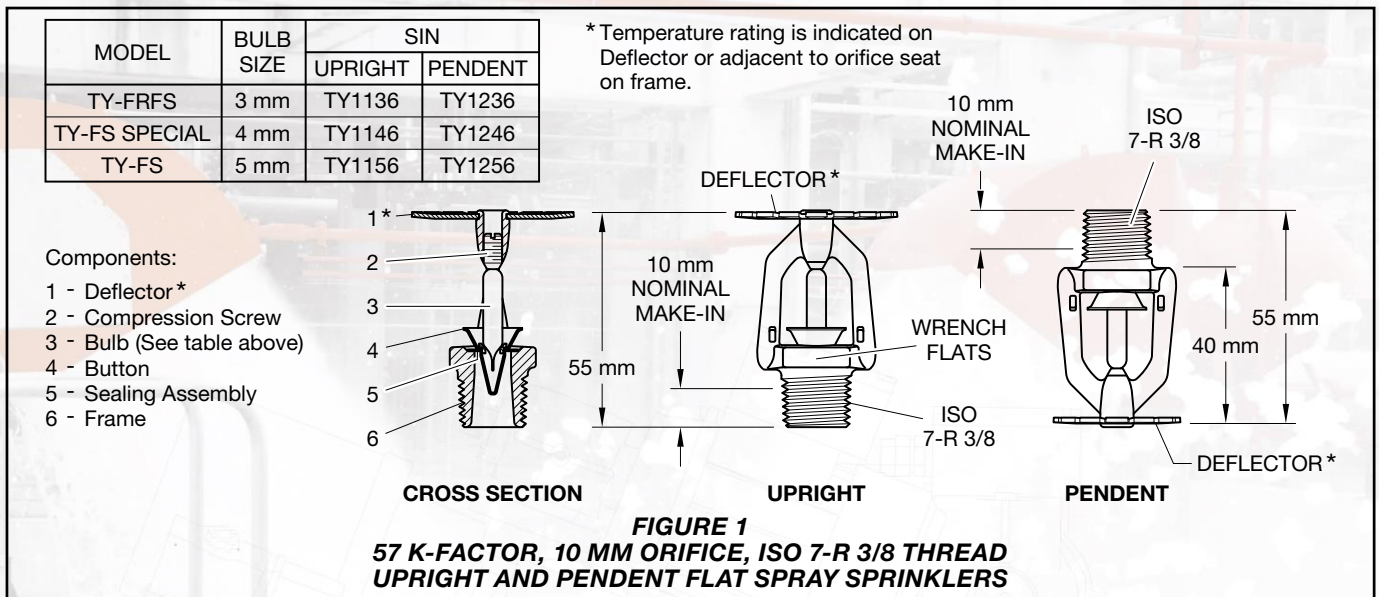
Physical Characteristics

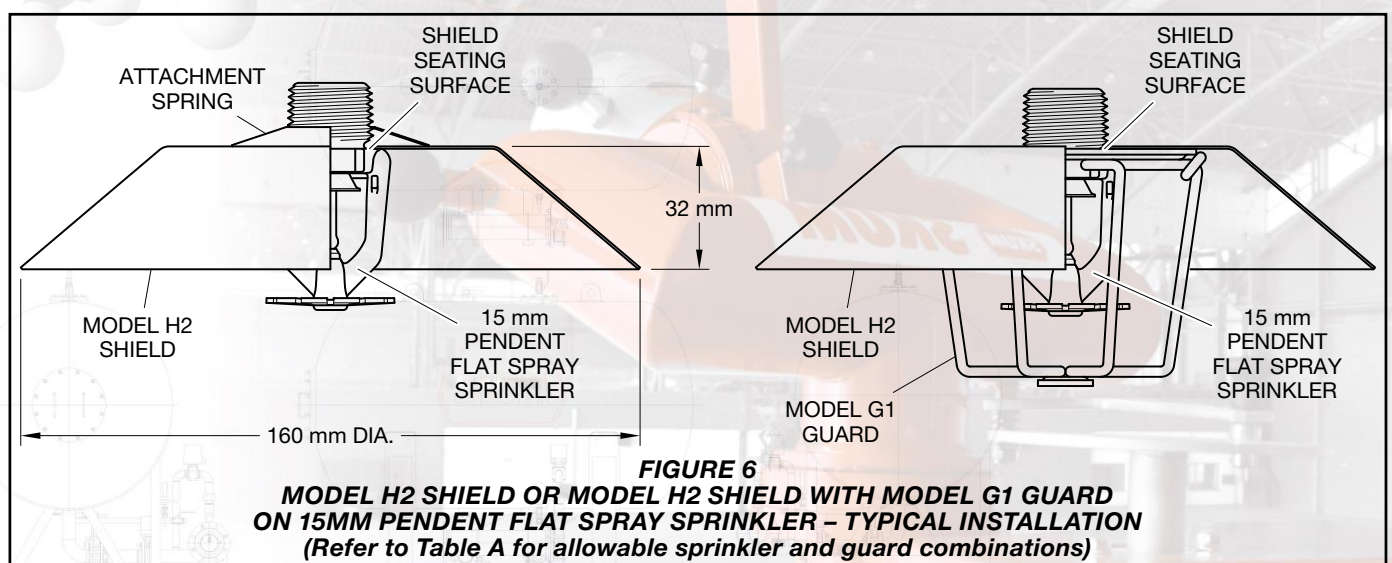
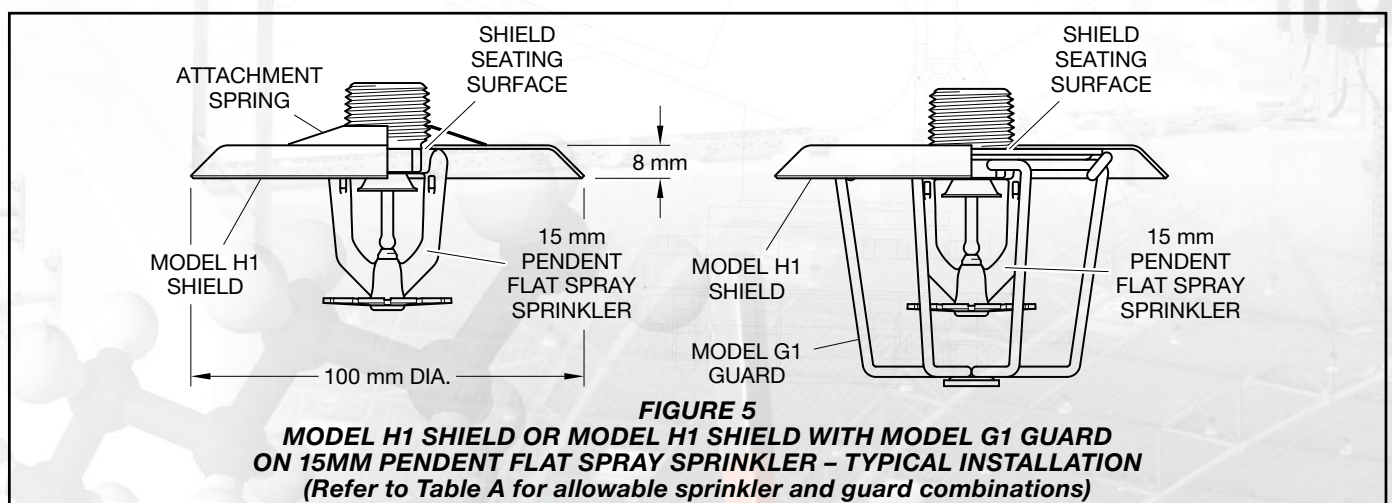
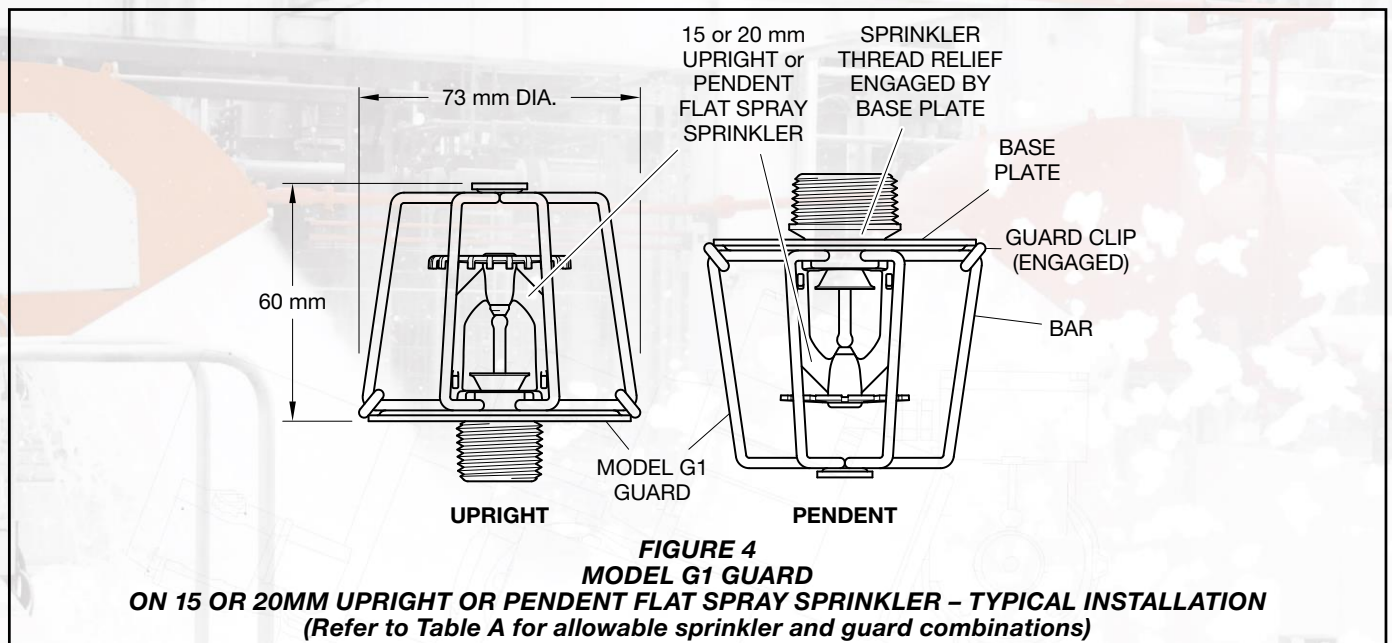
FrameBronze
 ButtonBronze/Copper
 Sealing Assembly . . .Beryllium Nickel w/TEFLON
 Bulb Glass
 Compression ScrewBronze
 Deflector Copper
 Guard Welded Carbon Steel
 Shield Carbon Steel
 Shield Spring:Carbon Steel

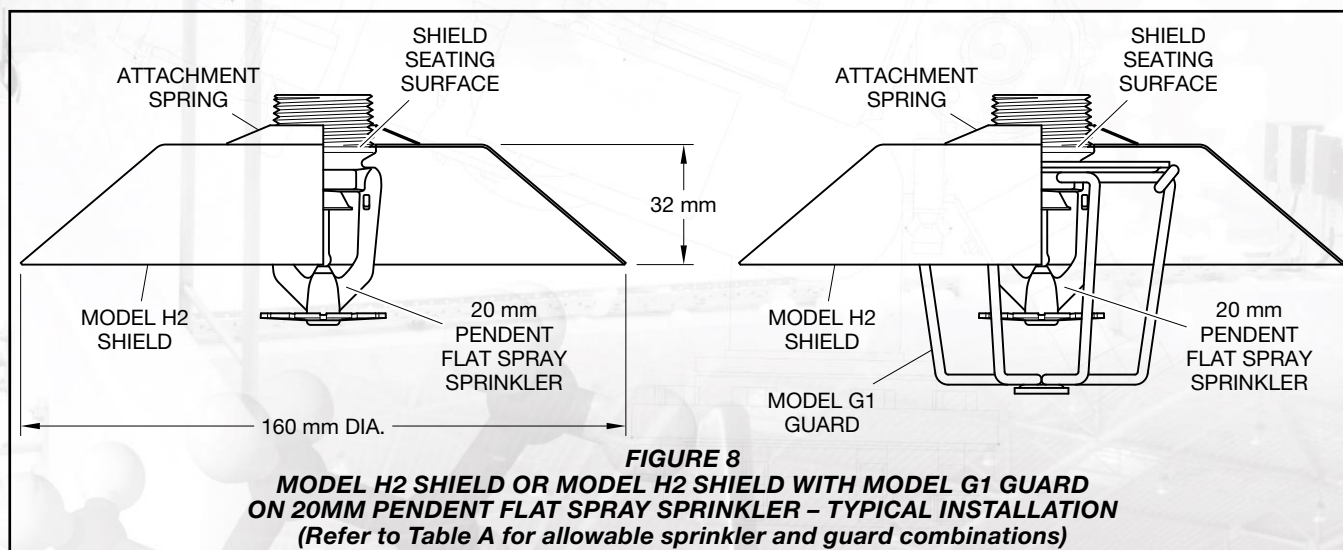
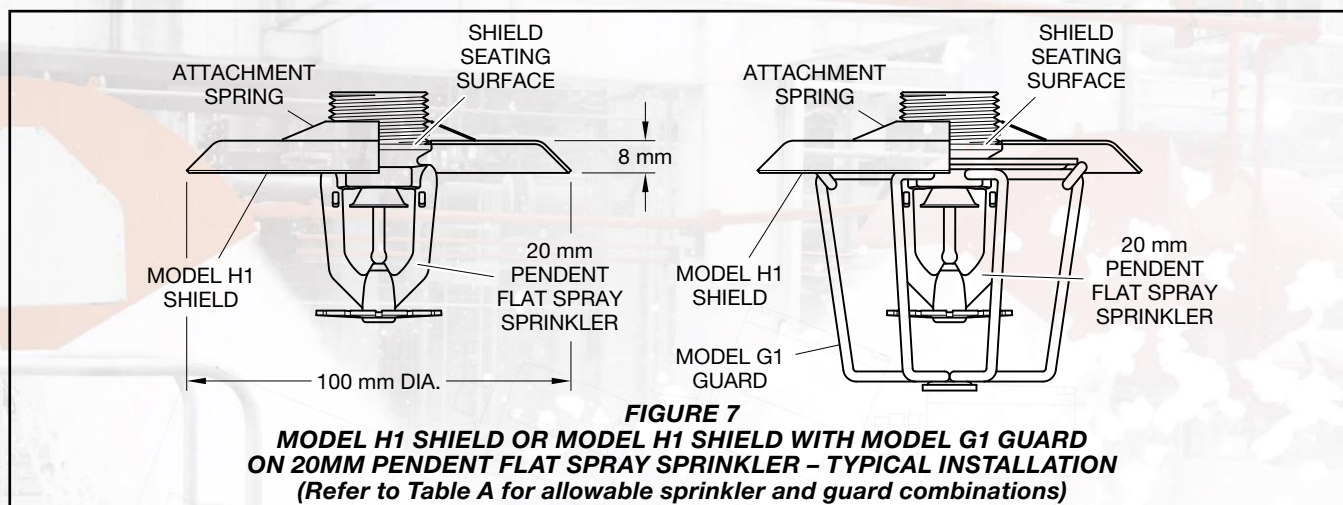
Design Criteria

The Model TY-FRFS, TY-FS Special, and TY-FS Flat Spray Sprinklers are only intended for installation per CEA 4001 *Sprinkler Systems Planning and Installation* or EN12845 *Automatic Sprinkler Systems – Design, Installation and Maintenance* where flat spray sprinklers are permitted.

Note: In all cases, CEA 4001 *Sprinkler Systems Planning and Installation* or EN12845 *Automatic Sprinkler Systems – Design, Installation and Maintenance* must be referenced and followed to ensure an effective installation. The Flat-Spray Sprinklers have significantly different water distribution characteristics from that of conventional and spray pattern sprinklers that has enabled the Flat-Spray Sprinklers to be used in conformance with CEA 4001 *Sprinkler Systems Planning and Installation* or EN12845 *Automatic Sprinkler Systems – Design, Installation and Maintenance*.







Installation

Installation instructions are provided in the following subsections:

- Sprinkler Only Installation
- Sprinkler with Guard Installation
- Sprinkler with Shield Installation
- Sprinklers with Guard and Shield Installation

See the Sprinkler Only Installation subsection for general instructions.

Sprinkler Only Installation

The Model TY-FRFS, TY-FS Special, and TY-FS Sprinklers must be installed in accordance with this section.

General Instructions

Do not install any bulb type sprinkler if the bulb is cracked or there is a loss of liquid from the bulb. With the sprinkler held horizontally, a small air bubble should be present. The diameter of the air bubble is approximately 1,6 mm for 57°C to 2,4 mm for the 141°C temperature ratings.

A leak-tight ISO 7-R 3/8 sprinkler joint should be obtained by applying a minimum-to-maximum torque of 8 to 16 N·m.

A leak tight 1/2 in. NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 9,5 to 19,0 N·m.

A leak tight 3/4 in. NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 13,4 to 26,8 N·m. Higher levels of torque may

distort the sprinkler inlet and cause leakage or impairment of the sprinkler.

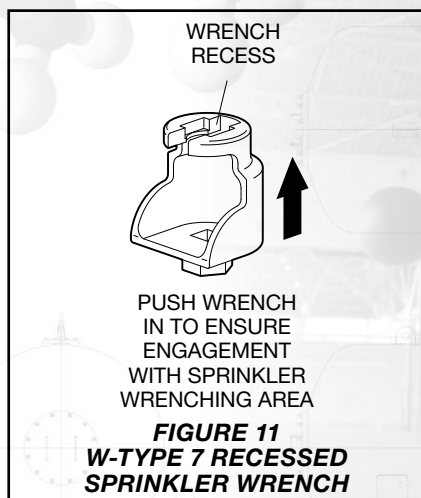
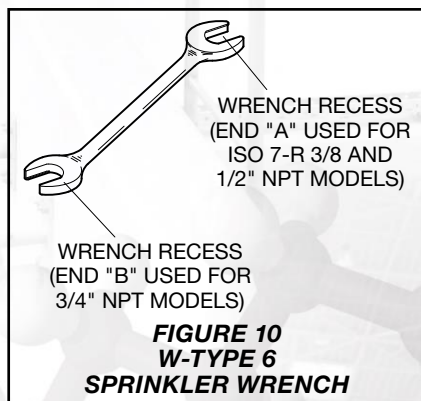
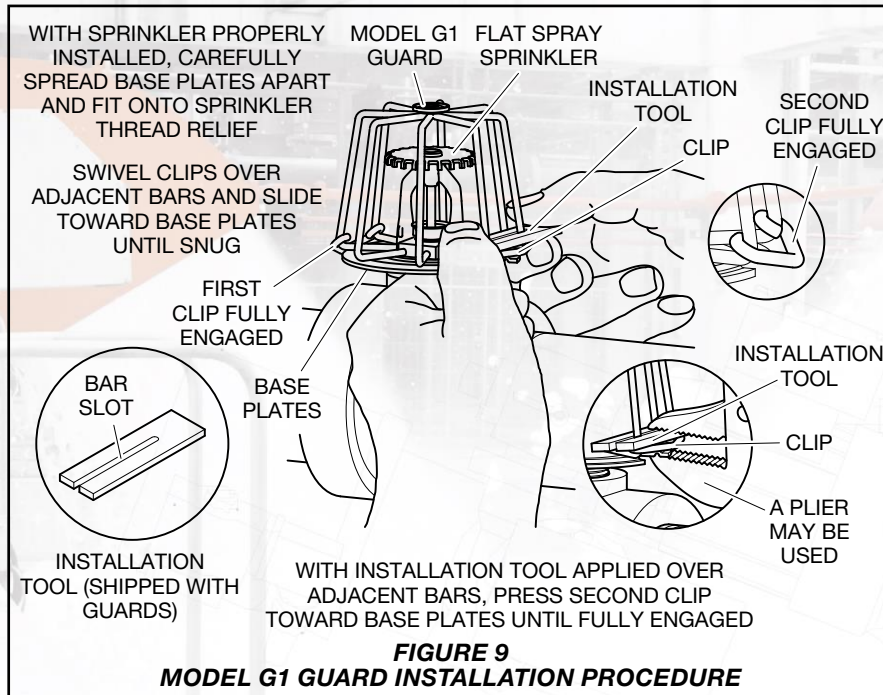
Do not attempt to make-up for insufficient adjustment in the escutcheon plate by under- or over-tightening the sprinkler. Readjust the position of the sprinkler fitting to suit.

Note: Pendent sprinklers are to be installed in the pendent position; upright sprinklers are to be installed in the upright position.

Step 1. With pipe thread sealant applied to the pipe threads, hand-tighten the sprinkler into the sprinkler fitting.

Step 2. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (See Figure 10). With reference to Figures 1, 2, and 3 the W-Type 6 Sprinkler Wrench is to be applied to the wrench flats.





Sprinkler with Guard Installation

With reference to Figures 4 and 9, 15 mm or 20 mm Upright or Pendent Sprinklers with Model G1 Guard must be installed in accordance with this section:

Step 1. The G1 Guard is to be mounted on the sprinkler after the sprinkler has been installed in accordance with the Sprinklers Only Installation subsection.

Step 2. With the Clips loose, first spread the two halves of the Sprinkler Guard just enough to pass by the sprinkler deflector from the side. Then, once again spread the two halves of the Sprinkler Guard just enough to pass over the Thread Relief portion of the sprinkler. (See Figures 2 and 3)

Step 3. With the Sprinkler Guard positioned on the Thread Relief portion of the sprinkler, as applicable, engage the Clips and then slide the Clips until they seat against the Base Plate to complete the installation as shown in Figure 4.

To help assist with the sliding of the Clips, the Guard Installation Tool maybe used as shown in Figure 9. In addition, pliers can be used to facilitate the final seating of the Clips.

Note: The Clips must seat against the Base Plate in order to be considered fully seated and in order to complete the installation.

The G1 Guard may be located in any position relative to the sprinkler frame arms.

Sprinkler with Shield Installation

With reference to Figures 5, 6, 7, or 8, 15 mm or 20 mm Pendent Sprinklers with Model H1 or Model H2 Shield must be installed in accordance with this section:

Note: Pendent sprinklers are to be installed in the pendent position.

Step 1. With pipe thread sealant applied to the pipe threads, install the Shield over the sprinkler threads.

Step 2. Place the Attachment Spring over the sprinkler threads, seating it against the Shield.

Step 3. Hand-tighten the sprinkler into the sprinkler fitting.

Step 4. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Recessed Sprinkler Wrench (See Figure 11). The wrench is to be applied to the sprinkler wrenching area shown in Figures 2 or 3, as applicable.

Note: When installed correctly, the Attachment Spring will be slightly compressed and the Shield will be held firmly in place.

Sprinkler with Guard and Shield Installation

With reference to Figures 5, 6, 7, or 8, 15 or 20 mm Pendent Sprinklers with Model H1 or Model H2 Shield and Model G1 Guard must be installed in accordance with this section:

Note: Pendent sprinklers are to be installed in the pendent position.

Step 1. With pipe thread sealant applied to the pipe threads, install the Shield over the sprinkler threads.

Step 2. When installing K115 Sprinklers, place the Attachment Spring over the sprinkler threads, seating it against the Shield.

Note: An Attachment Spring is not utilized for K80 Sprinklers with Guard and Shield.

Step 3. Hand tighten the sprinkler into the sprinkler fitting.

Step 4. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Sprinkler Wrench (See Figure 11). The wrench is to be applied to the sprinkler wrenching area shown in Figures 2 or 3, as applicable.

Step 5. After the sprinkler with shield is installed into the sprinkler pipe fitting, install the guard as described in the Sprinkler with Guard Installation subsection.

P/N 51 - XXX - 1 - XXX						TEMPERATURE RATING		
						135	135°F (57°C)	
						155	155°F (68°C)	
						175	175°F (79°C)	
						200	200°F (93°C)	
						286	286°F (141°C)	
						SPRINKLER FINISH		
						1	NATURAL BRASS	
MODEL TY-FRFS			MODEL TY-FS SPECIAL			MODEL TY-FS		
SIN	DESCRIPTION		SIN	DESCRIPTION		SIN	DESCRIPTION	
380	TY1136	K57 UPRIGHT, ISO 7-R 3/8	480	TY1146	K57 UPRIGHT, ISO 7-R 3/8	580	TY1156	K57 UPRIGHT, ISO 7-R 3/8
382	TY1236	K57 PENDENT, ISO 7-R 3/8	482	TY1246	K57 PENDENT, ISO 7-R 3/8	582	TY1256	K57 PENDENT, ISO 7-R 3/8
370	TY3136	K80 UPRIGHT, 1/2 in. NPT	470	TY3146	K80 UPRIGHT, 1/2 in. NPT	570	TY3156	K80 UPRIGHT, 1/2 in. NPT
371	TY3236	K80 PENDENT, 1/2 in. NPT	471	TY3246	K80 PENDENT, 1/2 in. NPT	571	TY3256	K80 PENDENT, 1/2 in. NPT
390	TY4136	K115 UPRIGHT, 3/4 in. NPT	490	TY4146	K115 UPRIGHT, 3/4 in. NPT	590	TY4156	K115 UPRIGHT, 3/4 in. NPT
391	TY4236	K115 PENDENT, 3/4 in. NPT	491	TY4246	K115 PENDENT, 3/4 in. NPT	591	TY4256	K115 PENDENT, 3/4 in. NPT

TABLE B
FLAT SPRAY SPRINKLERS
PART NUMBER SELECTION

Care and Maintenance

The Model TY-FRFS, TY-FS Special, and TY-FS Sprinklers must be maintained and serviced in accordance with this section:

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

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

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

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

liquid from its bulb. Refer to the Installation section for additional information.

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 authorities having jurisdiction. Contact the installing contractor or product manufacturer with any questions.

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

Limited Warranty

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

Ordering Procedure

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

Note: Sprinklers, wrenches, guards, shields, attachment springs, and additional clip installation tool are all sold separately.

Sprinkler Assemblies

Specify: Model (TY-FRFS, TY-FS Special, or TY-FS), (specify SIN), (specify Standard, Special, or Quick) Response, (specify 57, 80, or 115) K-factor, (specify temperature rating), (specify Pendent or Upright) Sprinklers, P/N (specify from Table B)

Sprinkler Wrenches

Specify: W-Type (specify) Sprinkler Wrench, P/N (specify):

W-6 56-000-6-387
 W-7 56-850-4-001

Guards

Specify: Model G1 Guard with (specify) finish, P/N (specify):

Red Painted 56-938-1-001
 Zinc Chromate 56-938-9-001

Shields

Specify: Model (specify), (specify NPT size) Shield, P/N (specify):

H1, 1/2 in. NPT 22521
 H1, 3/4 in. NPT 22522
 H2, 1/2 in. NPT 22529
 H2, 3/4 in. NPT 22524

Attachment Springs

Specify: (specify NPT size) Shield Spring, P/N (specify):

1/2 in. NPT 22526
 3/4 in. NPT 22527

Additional* Clip Installation Tool

Specify: Clip Installation Tool for G1 Guard, P/N 56-000-8-597

* The Clip Installation Tool is included with guard orders in original cartons.



1467 Elmwood Avenue, Cranston, RI 02910 | Telephone +1-401-781-8220

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TFP635 Change History Appendix

ISSUE DATE	NOTES
08-22	Page 1, added QR code and URL to allow convenient access to electronic version from printed document; Page 2, Table A and Approvals sub-section, added EAC Approved; Page 8, changed corporate address and telephone number to 1467 Elmwood Avenue, Cranston, RI 02910 Telephone +1-401-781-8220, formerly 1400 Pennbrook Parkway, Lansdale, PA 19446 Telephone +1-215-362-0700.
08-20	Updated part numbers for Model G1 Sprinkler Guard.
03-20	Removed LPCB certification from Model TY-FRFS TY4236 Pendent K115, Model TY-FS TY3256 K80, TY4156 Upright K115, and TY4256 Pendent K115.
08-18	Updated Tyco® branding and document format; Added Johnson Controls copyright; Added disclaimer stating specifications and information subject to change without notice; Added reference to Regulatory and Health Warning Technical Data Sheet TFP2300.
10-15	Correct 51 prefix in Table B Part Number Selection matrix, formerly shown as 57.
05-15	Restored Model TY-FRFS K57 Upright TY1136 to Ordering Procedure.
01-14	Added LPCB Approved for TY-FRFS Quick Response (3 mm bulb) and TY-FS Standard Response (5 mm bulb) sprinklers.
05-06	Added Model H2 1/2 in. NPT Shield.
10-05	New Technical Data Sheet TFP635 describes Flat Spray Sprinklers and accessories, Eastern Hemisphere Sales Only.

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