

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

General Description

The Model TY-FRFS, TY-FS Special, and TY-FS, Upright and Pendent, Flat Spray Sprinklers described in this data sheet 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 80K and 115K, 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 TY-FS 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.

WARNINGS

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. The installing contractor or sprinkler manufacturer should be contacted with any questions.



Model TY-FRFS



Model TY-FS Special



Model TY-FS

IMPORTANT

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.

Series	Bulb Size	Orifice	Position	SIN	Guard	Shield	Guard/Shield
TY-FRFS	3 mm	57K, 10 mm	Upright	TY1136	N/A	N/A	N/A
TY-FS Special	4 mm			TY1146	N/A	N/A	N/A
TY-FS	5 mm			TY1156	N/A	N/A	N/A
TY-FRFS	3 mm		Pendent	TY1236	N/A	N/A	N/A
TY-FS Special	4 mm			TY1246	N/A	N/A	N/A
TY-FS	5 mm			TY1256	N/A	N/A	N/A
TY-FRFS	3 mm	80K, 15 mm	Upright	TY3136	G1	N/A	N/A
TY-FS Special	4 mm			TY3146	G1	N/A	N/A
TY-FS	5 mm			TY3156	G1	N/A	N/A
TY-FRFS	3 mm		Pendent	TY3236	G1	H1or H2	G1/H1 or G1/H2
TY-FS Special	4 mm			TY3246	G1	H1or H2	G1/H1 or G1/H2
TY-FS	5 mm			TY3256	G1	H1or H2	G1/H1 or G1/H2
TY-FRFS	3 mm	115K, 20 mm	Upright	TY4136	G1	N/A	N/A
TY-FS Special	4 mm			TY4146	G1	N/A	N/A
TY-FS	5 mm			TY4156	G1	N/A	N/A
TY-FRFS	3 mm		Pendent	TY4236	G1	H1 or H2	G1/H1 or G1/H2
TY-FS Special	4 mm			TY4246	G1	H1 or H2	G1/H1 or G1/H2
TY-FS	5 mm			TY4256	G1	H1 or H2	G1/H1 or G1/H2

TABLE A
ALLOWABLE COMBINATIONS OF GUARDS, SHIELDS, AND GUARDS WITH SHIELDS

Model/Sprinkler Identification Numbers

Model FRFS (3 mm Bulb)

TY1136 - Upright 57K
 TY1236 - Pendent 57K
 TY3136 - Upright 80K
 TY3236 - Pendent 80K
 TY4136 - Upright 115K
 TY4236- Pendent 115K

Model FS Special (4 mm Bulb)

TY1146 - Upright 57K
 TY1246 - Pendent 57K
 TY3146 - Upright 80K
 TY3246 - Pendent 80K
 TY4146 - Upright 115K
 TY4246- Pendent 115K

Model FS (5 mm Bulb)

TY1156 - Upright 57K
 TY1256 - Pendent 57K
 TY3156 - Upright 80K
 TY3256 - Pendent 80K
 TY4156 - Upright 115K
 TY4256- Pendent 115K

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

The Flat Spay Sprinklers are VdS Approved for installation per CEA 4001 "Sprinkler Systems Planning and Installation" or EN12845 "Automatic Sprinkler Systems - Design, Installation and Maintenance".

The Guards, Shields, and Guards with Shields are VdS Approved with the combinations of product shown in Table A.

For details contact Tyco Fire & Building Products, Enschede, Netherlands:
 Tel. 31-53-428-4444
 Fax 31-53-428-3377

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 in °C

57, 68, 79, 93, and 141

Finishes

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

Physical Characteristics

Frame Bronze
 Button Copper
 Sealing Assembly
 Beryllium Nickel w/Teflon*
 Bulb Glass
 Compression Screw Bronze
 Deflector Copper

Guard Welded Carbon steel
 Shield Carbon Steel
 Shield Spring Carbon Steel

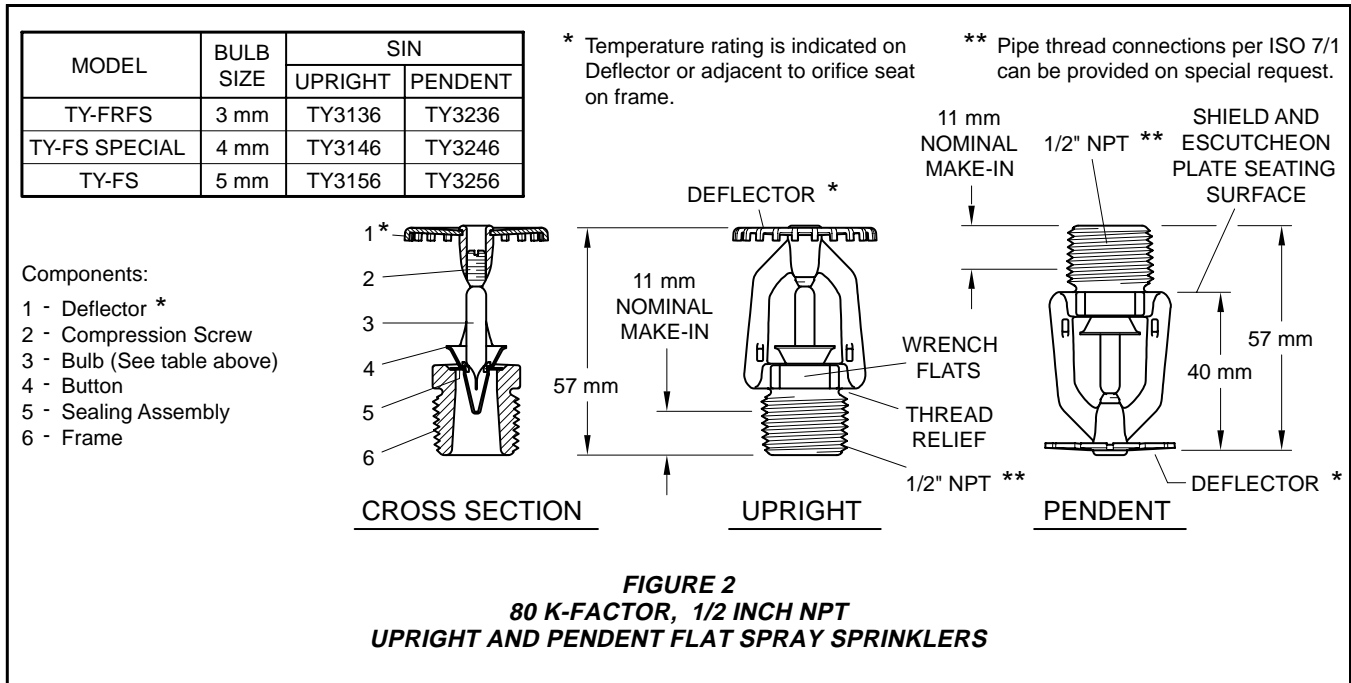
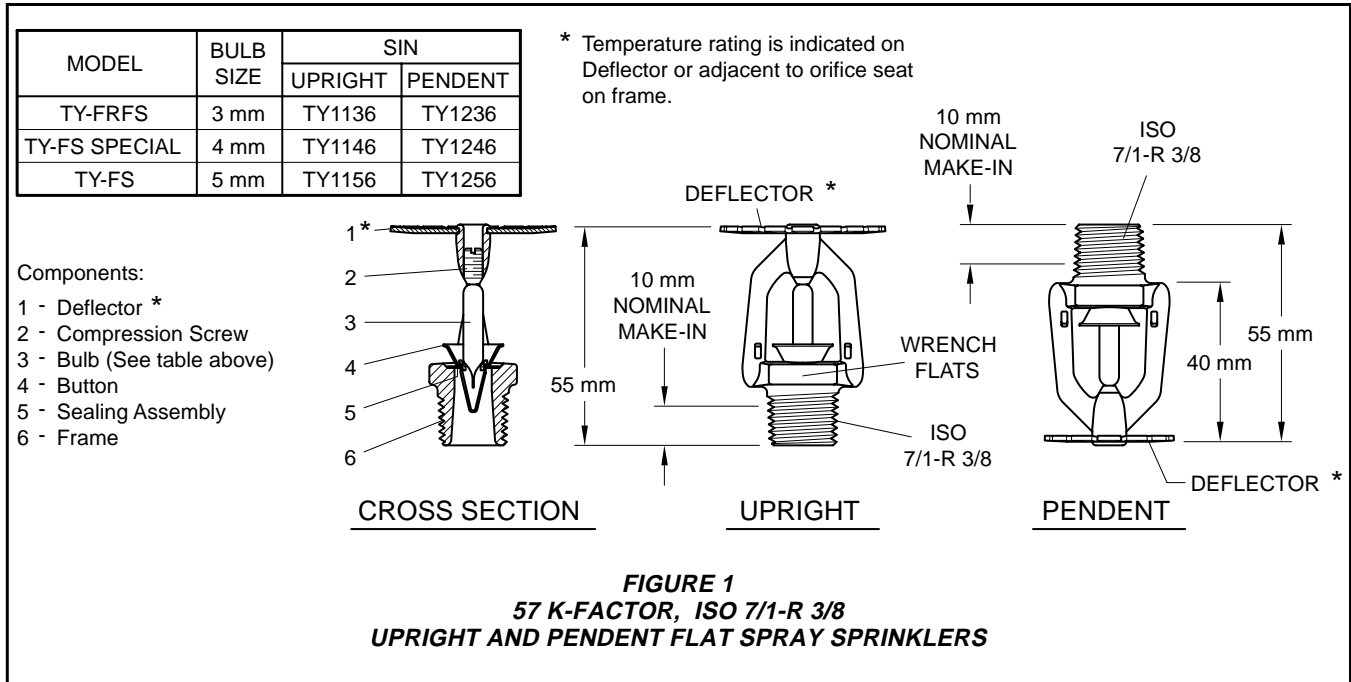
* Registered trademark of DuPont

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 Spay 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".



MODEL	BULB SIZE	SIN	
		UPRIGHT	PENDENT
TY-FRFS	3 mm	TY4136	TY4236
TY-FS SPECIAL	4 mm	TY4146	TY4246
TY-FS	5 mm	TY4156	TY4256

* Temperature rating is indicated on Deflector or adjacent to orifice seat on frame.

** Pipe thread connections per ISO 7/1 can be provided on special request.

Components:

- 1 - Deflector *
- 2 - Compression Screw
- 3 - Bulb (See table above)
- 4 - Button
- 5 - Sealing Assembly
- 6 - Frame

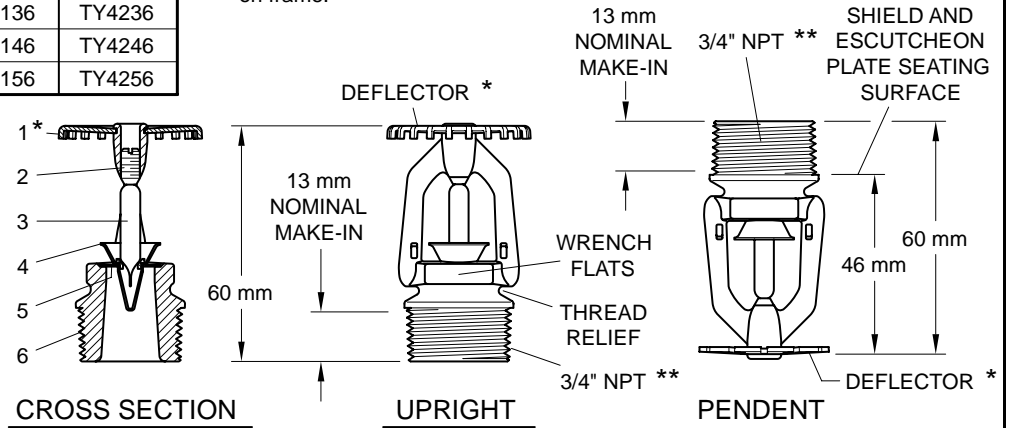


FIGURE 3
115 K-FACTOR, 3/4 INCH NPT
UPRIGHT AND PENDENT FLAT SPRAY SPRINKLERS

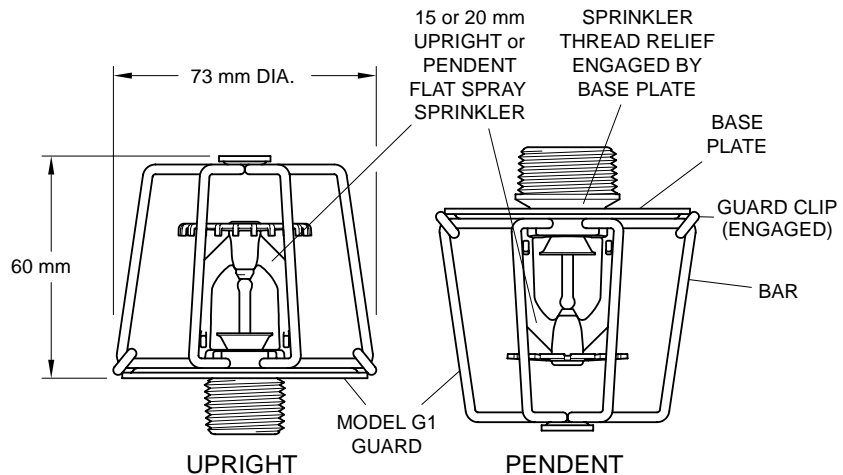
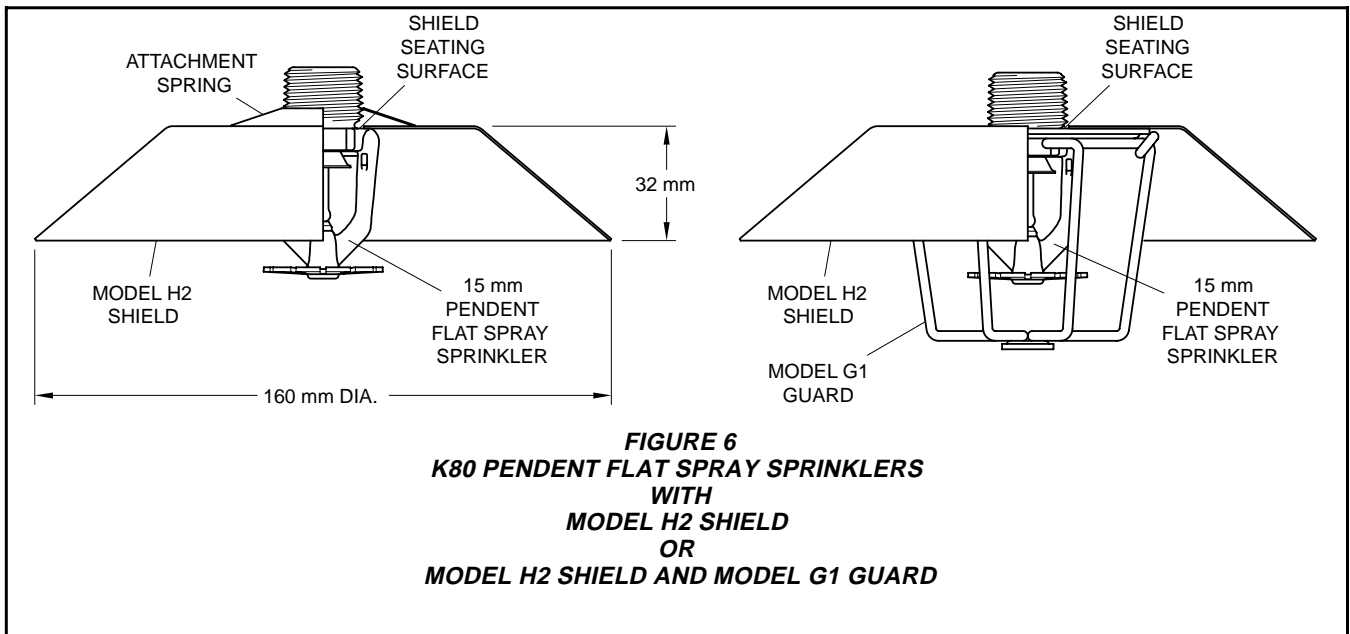
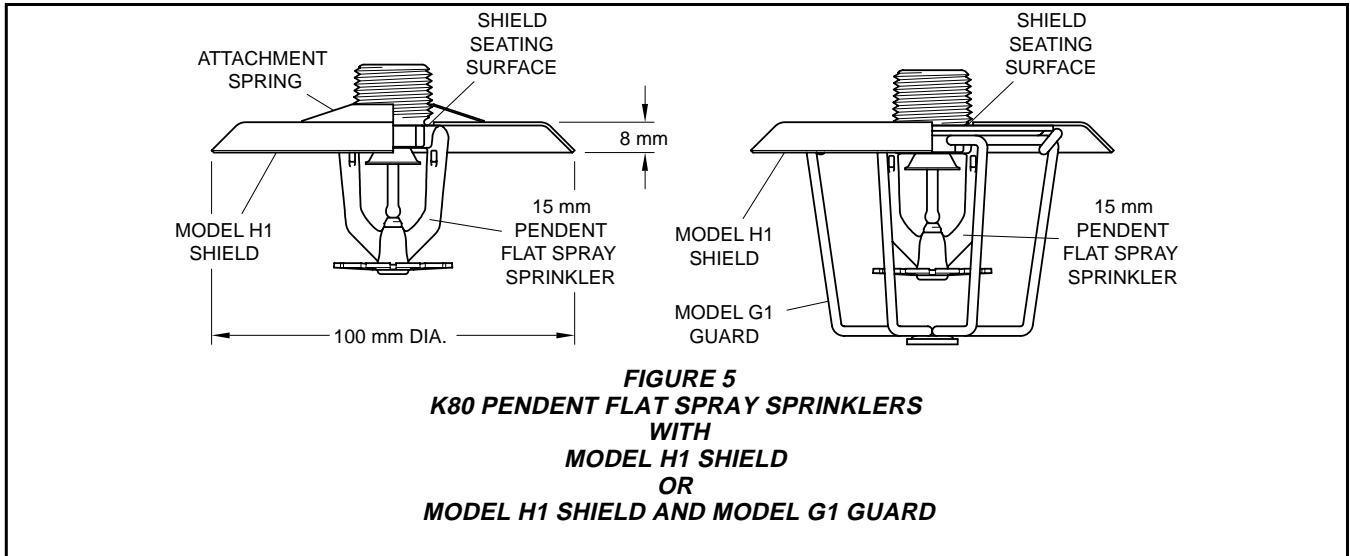
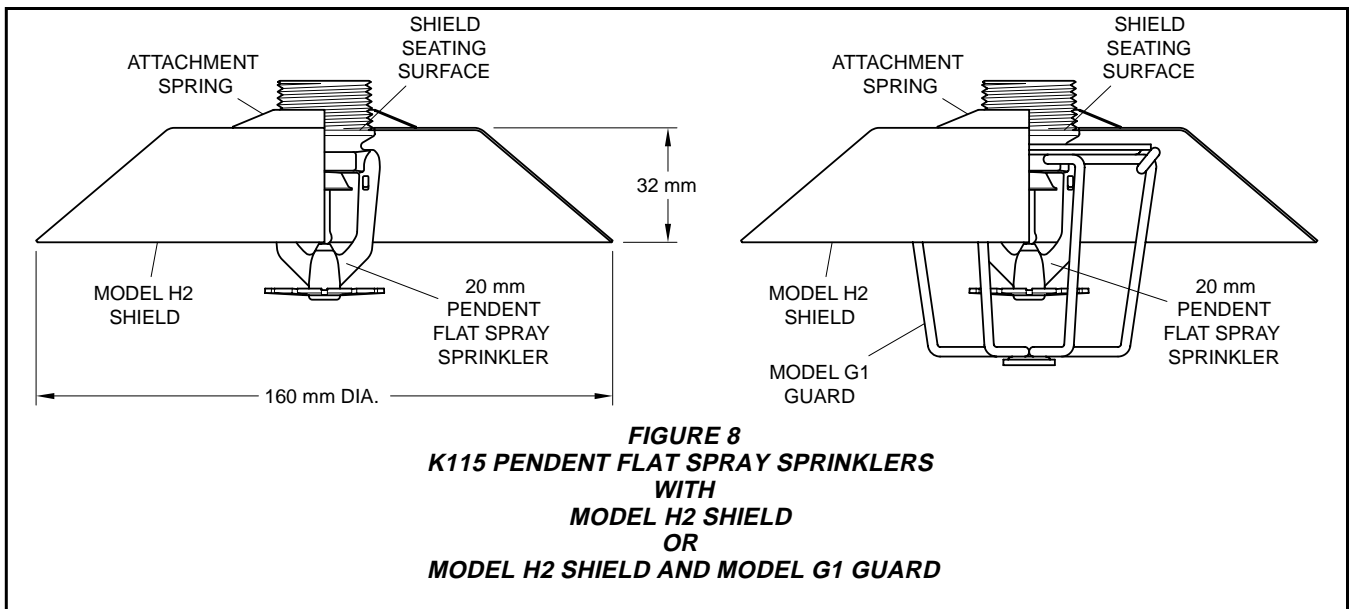
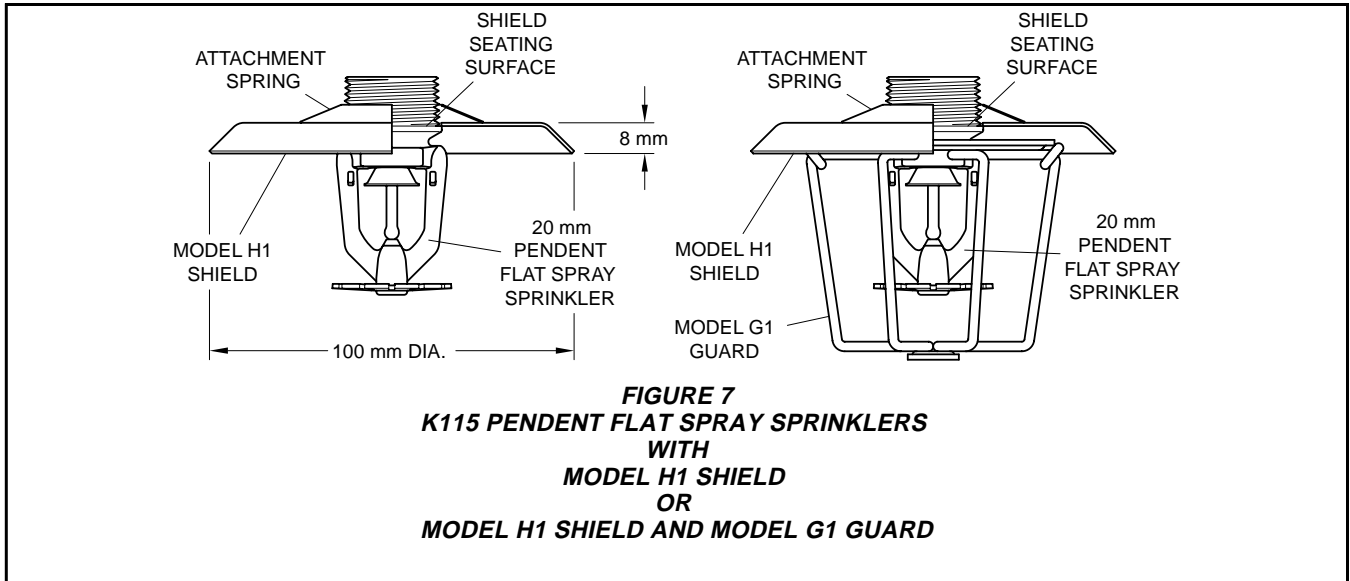


FIGURE 4
MODEL G1 GUARD
TYPICAL INSTALLATION ON UPRIGHT AND PENDENT FLAT SPRAY SPRINKLERS





Installation

Installation instructions are provided in the following subsections:

- Sprinkler Only
- Sprinkler With Guard
- Sprinkler With Shield
- Sprinklers With Guard & Shield

SPRINKLER ONLY

The Model TY-FRFS, TY-FS Special, and TY-FS Sprinklers must be installed in accordance with the following instructions:

NOTES

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 1/16 inch (1,6 mm) for the 135°F/57°C to 3/32 inch (2,4 mm) for the 360°F/182°C temperature ratings.

A leak tight 1/2 inch NPT sprinkler joint should be obtained with a torque of 7 to 14 ft.lbs. (9,5 to 19,0 Nm). A maximum of 21 ft. lbs. (28,5 Nm) of torque may be used to install sprinklers with 1/2 NPT connections. A leak tight 3/4 inch NPT sprinkler joint should be obtained with a torque of 10 to 20 ft.lbs. (13,4 to 26,8 Nm). A maximum of 30 ft.lbs. (40,7 Nm) of torque is to be used to install sprinklers with 3/4 NPT connections. 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.

Step 1. Pendent sprinklers are to be installed in the pendent position, and upright sprinklers are to be installed in the upright position.

Step 2. With pipe thread sealant applied to the pipe threads, hand tighten the sprinkler into the sprinkler fitting.

Step 3. Tighten the sprinkler into the sprinkler fitting using only the W-Type 6 Sprinkler Wrench (Ref. 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

With reference to Figure 4, the Model G1 Guard must be installed as follows:

Step 1. The G1 Guard is to be

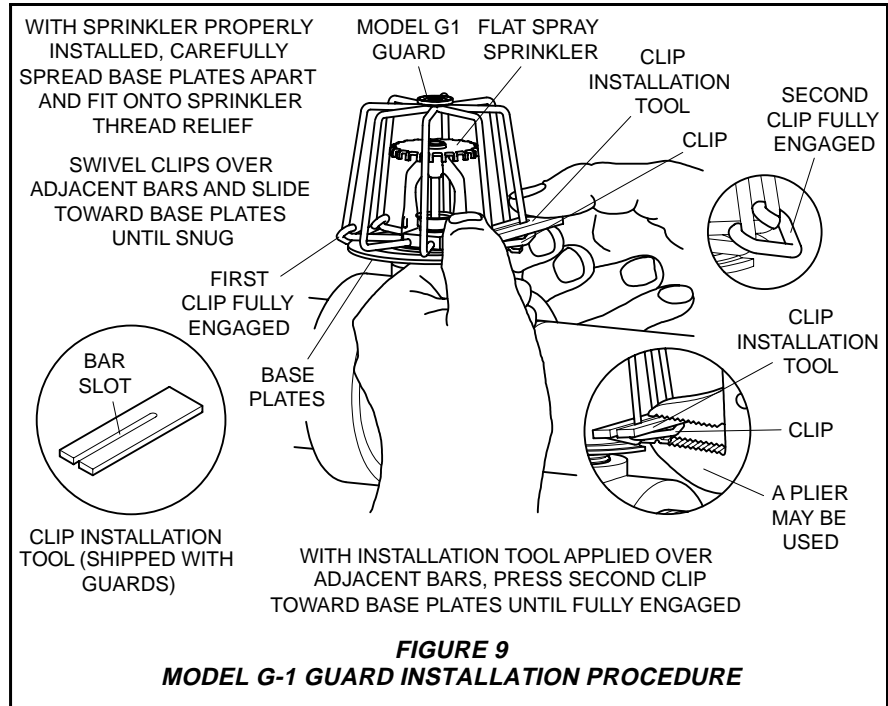
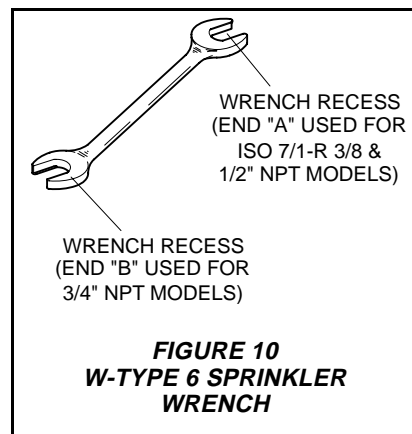


FIGURE 9
MODEL G-1 GUARD INSTALLATION PROCEDURE

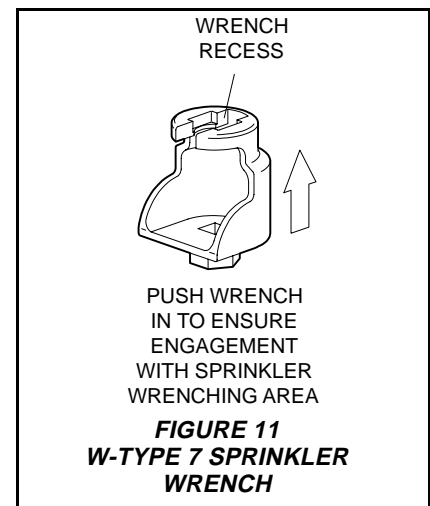


mounted on the sprinkler after the sprinkler has been installed in accordance with the "Sprinklers Only" subsection.

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 sprinkler "thread relief" portion of the sprinkler. (Refer to 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 to complete the installation as shown in Figure 4.

To help assist with the sliding of the Clips, the Guard Installation Tool may be used as shown in Figure 9. In addition,



tion, pliers can be used to facilitate the final seating of the Clips.

NOTES

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

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

SPRINKLER WITH SHIELD

With reference to Figures 5, 6, 7, or 8, the Model H1 or Model H2 Shield must be installed as follows:

Step 1. Pendent sprinklers are to be installed in the pendent position.

Step 2. With pipe thread sealant ap-

plied to the pipe threads, install the Shield over the sprinkler threads.

Step 3. Install the Attachment Spring over the sprinkler threads until it seats against the Shield.

Step 4. Hand tighten the sprinkler into the sprinkler fitting.

Step 5. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Sprinkler Wrench (Ref. 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

With reference to Figures 5, 6, 7 or 8, the guard with shield arrangement must be installed as follows:

Step 1. Pendent sprinklers are to be installed in the pendent position.

Step 2. With pipe thread sealant applied to the pipe threads, install the Shield over the sprinkler threads.

Step 3. When installing K115 Sprinklers, Install the Attachment Spring over the sprinkler threads until it seats against the Shield.

NOTE

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

Step 4. Hand tighten the sprinkler into the sprinkler fitting.

Step 5. Tighten the sprinkler into the sprinkler fitting using only the W-Type 7 Sprinkler Wrench (Ref. Figure 11). The wrench is to be applied to the sprinkler wrenching area shown in Figures 2 or 3, as applicable.

Step 7. After the sprinkler with shield is installed into the sprinkler pipe fitting, install the guard as described in the "Sprinkler With Guard" sub-section.

Care and Maintenance

The Model TY-FRFS, TY-FS Special, and TY-FS Sprinklers must be maintained and serviced in accordance with the following instructions:

NOTES

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. (Ref. Installation Section).

Proper installation of sprinklers installed with guards, shields, or guards with shields should be verified during the annual visual inspection of the sprinklers.

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 Approval agency and standards of any other authorities having jurisdiction. The installing contractor or sprinkler manufacturer should be contacted relative to 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

Products manufactured by Tyco Fire & Building Products (TFBP) are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by TFBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with the standards recognized by the Approval agency, as well as the standards of any other Authorities Having Jurisdiction. Materials found by TFBP to be defective shall be either repaired or replaced, at TFBP's sole option. TFBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFBP was informed about the possibility of such damages, and in no event shall TFBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

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MODEL/SIN			SPRINKLER MATERIAL	TEMPERATURE RATING (Fluid Color)	
380	TY-FRFS/TY1136	57K UPRIGHT, ISO 7/1-R 3/8	1 NATURAL BRASS	135	57°C (Orange)
382	TY-FRFS/TY1236	57K PENDENT, ISO 7/1-R 3/8		155	68°C (Red)
370	TY-FRFS/TY3136	80K UPRIGHT, 1/2 INCH NPT		175	79°C (Yellow)
371	TY-FRFS/TY3236	80K PENDENT, 1/2 INCH NPT		200	93°C (Green)
390	TY-FRFS/TY4136	115K UPRIGHT, 3/4 INCH NPT		286	141°C (Blue)
391	TY-FRFS/TY4236	115K PENDENT, 3/4 INCH NPT			

480	TY-FS Special/TY1146	57K UPRIGHT, ISO 7/1-R 3/8
482	TY-FS Special/TY1246	57K PENDENT, ISO 7/1-R 3/8
470	TY-FS Special/TY3146	80K UPRIGHT, 1/2 INCH NPT
471	TY-FS Special/TY3246	80K PENDENT, 1/2 INCH NPT
490	TY-FS Special/TY4146	115K UPRIGHT, 3/4 INCH NPT
491	TY-FS Special/TY4246	115K PENDENT, 3/4 INCH NPT

580	TY-FS/TY1156	57K UPRIGHT, ISO 7/1-R 3/8
582	TY-FS/TY1256	57K PENDENT, ISO 7/1-R 3/8
570	TY-FS/TY3156	80K UPRIGHT, 1/2 INCH NPT
571	TY-FS/TY3256	80K PENDENT, 1/2 INCH NPT
590	TY-FS/TY4156	115K UPRIGHT, 3/4 INCH NPT
591	TY-FS/TY4256	115K PENDENT, 3/4 INCH NPT

**TABLE A
PART NUMBER SELECTION
FLAT SPRAY SPRINKLERS**

Ordering Procedure

When placing an order, indicate the full product name. Refer to the Price List for complete listing of Part Numbers.

NOTE

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

Contact your local distributor for availability.

Sprinklers:

Specify: (Specify Model/SIN), (Specify Standard Response, Special Response, or Quick Response, (specify K-factor), (specify temperature rating), (specify Pendent or Upright) Sprinkler, P/N (specify from Table A).

Sprinkler Wrenches:

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

- W-6 P/N 56-000-6-387
- W-7 P/N 56-850-4-001

Guards:

Specify: Model G-1 Guard having (specify) finish, P/N (specify).

- Red Painted P/N 56-000-6-387
- Zinc Chromate P/N 56-850-4-001

Shields:

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

- H1, 1/2" NPT P/N 22521
- H1, 3/4" NPT P/N 22522
- H2, 1/2" NPT P/N 22529
- H2, 3/4" NPT P/N 22524

Attachment Springs:

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

- 1/2" NPT P/N 22526
- 3/4" NPT P/N 22527

Additional* Clip Installation Tools:

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.

