

Model TY-FRFS, TY-FS Special, and TY-FS Flat Spray Sprinklers, 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.

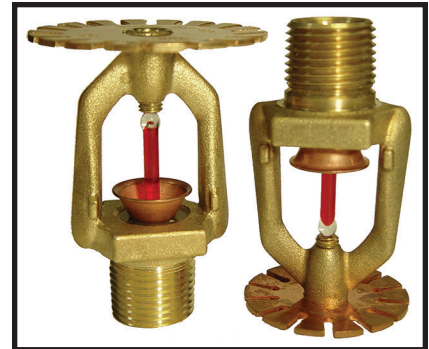
The Model TY-FRFS with its 3 mm diameter heat sensitive bulb element is rated quick response, the Model TYFS Special with its 4 mm diameter heat sensitive bulb element is rated special response, and the Model TY-FS with its 5 mm diameter heat sensitive bulb element is rated standard response “A.”

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.

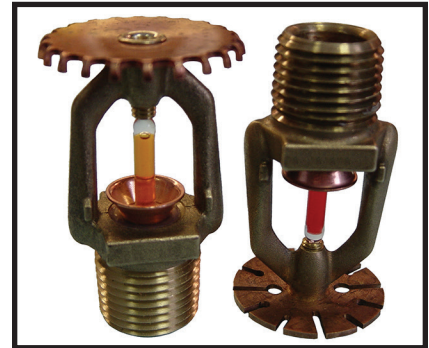
NOTICE

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.

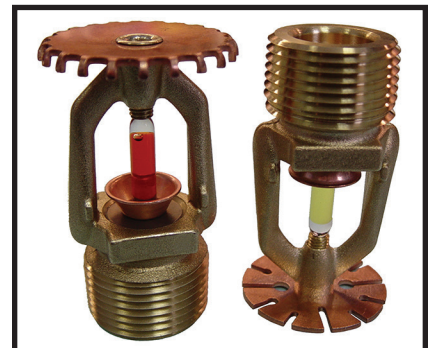
The owner is responsible for maintaining their fire protection system and devices in proper operating condition. Contact the installing contractor or sprinkler manufacturer with any questions.



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

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

Sprinkler Identification Numbers

Model TY-FRFS (3 mm Bulb)

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

Model TY-FS Special (4 mm Bulb)

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

Model TY-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."

LPCB approved (Refer to Table A)

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

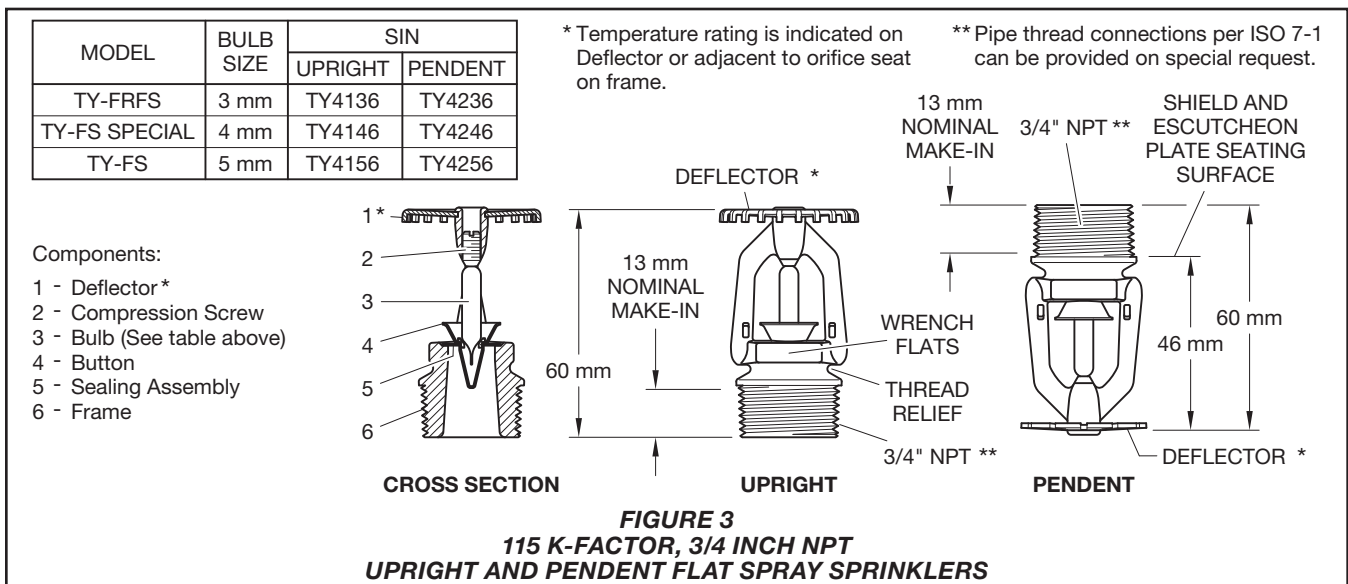
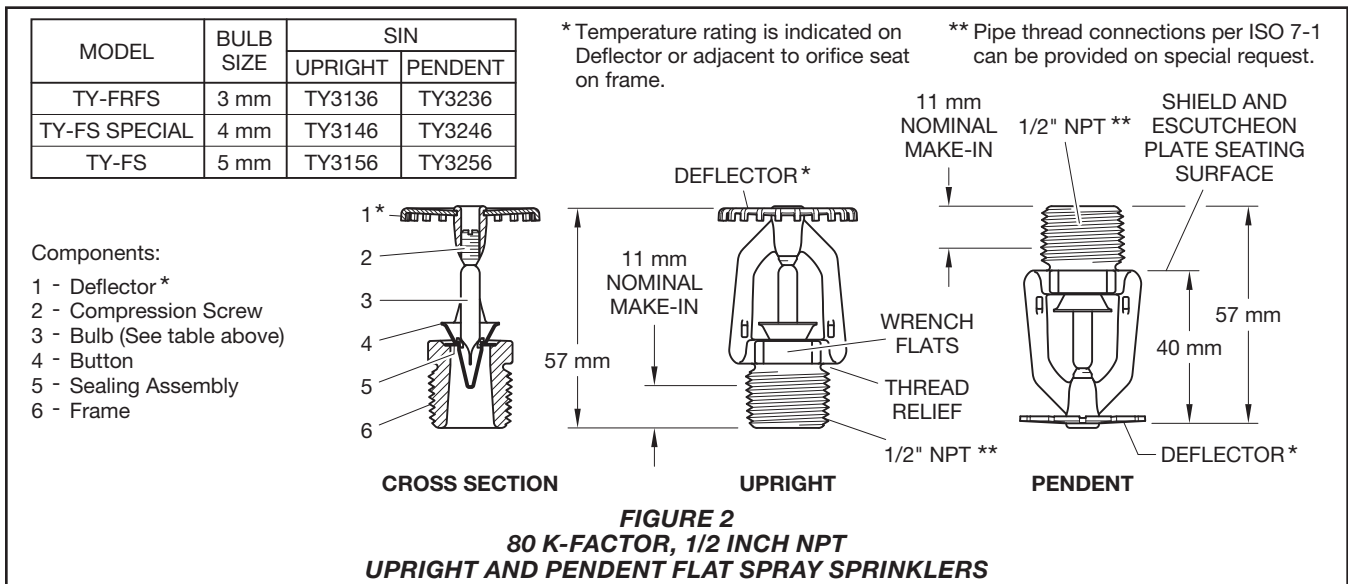
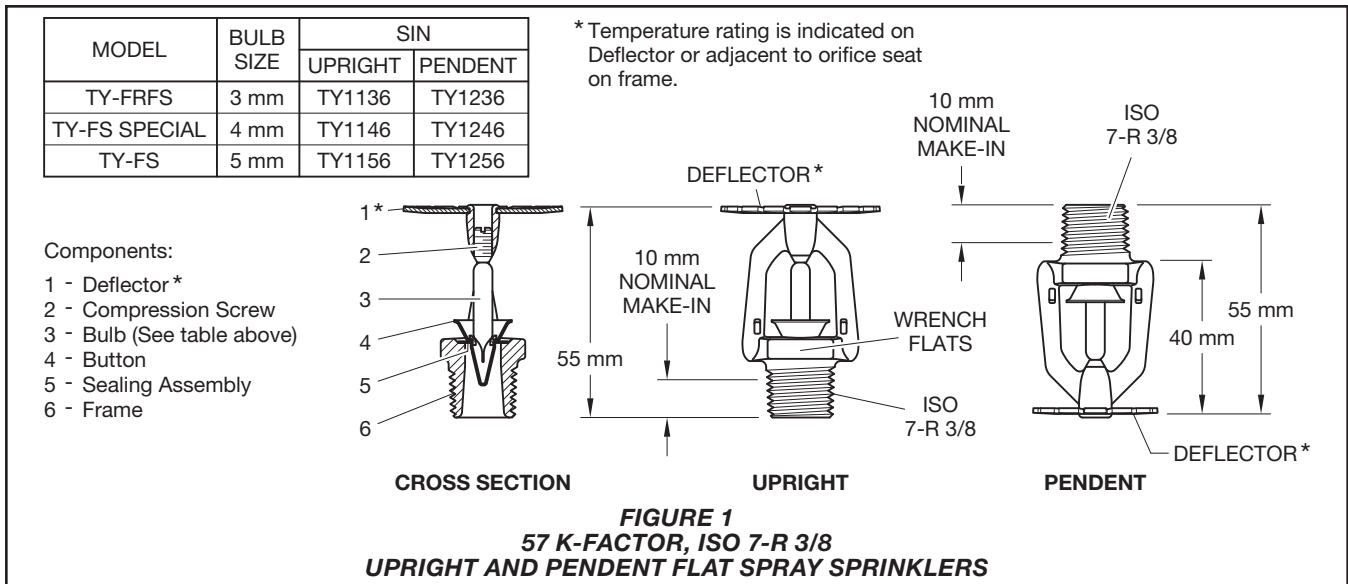
Frame Bronze
 Button Bronze/Copper
 Sealing Assembly Beryllium
 Nickel w/TEFLON

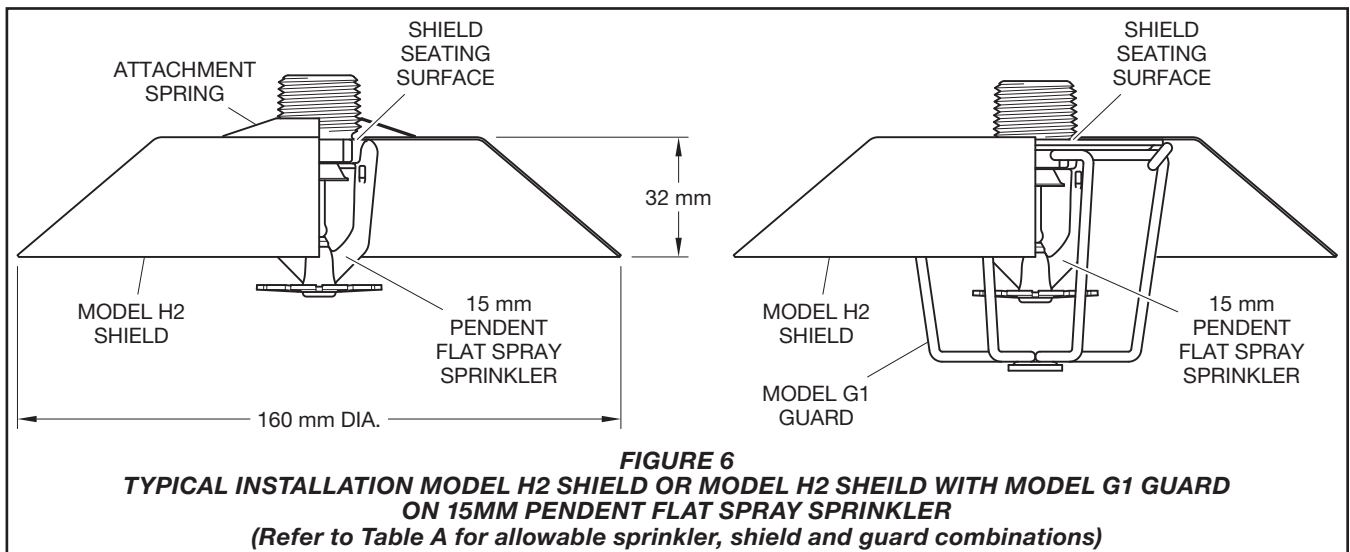
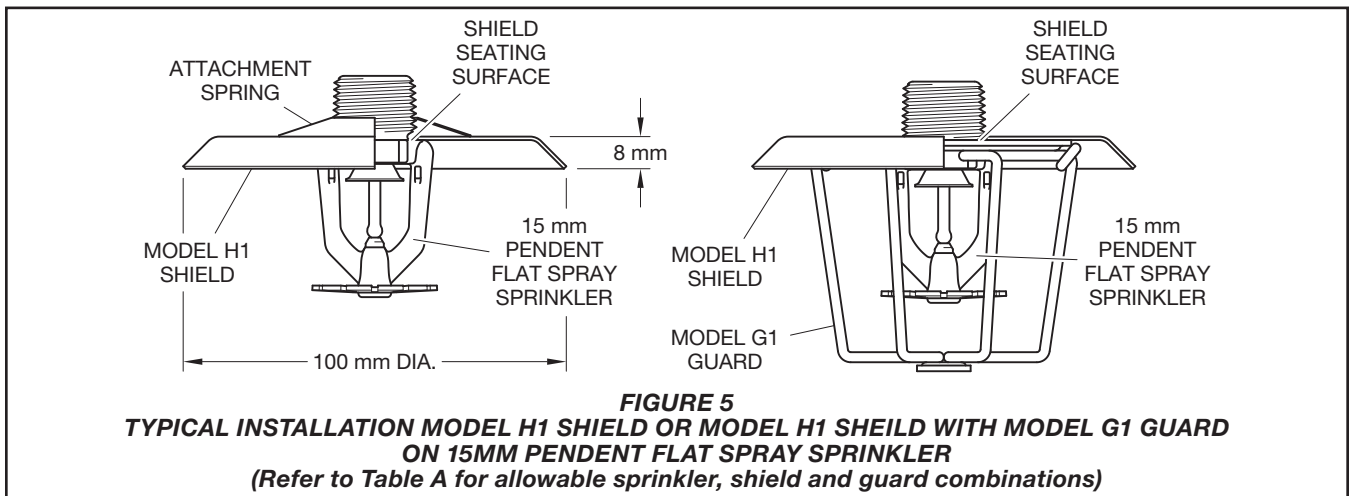
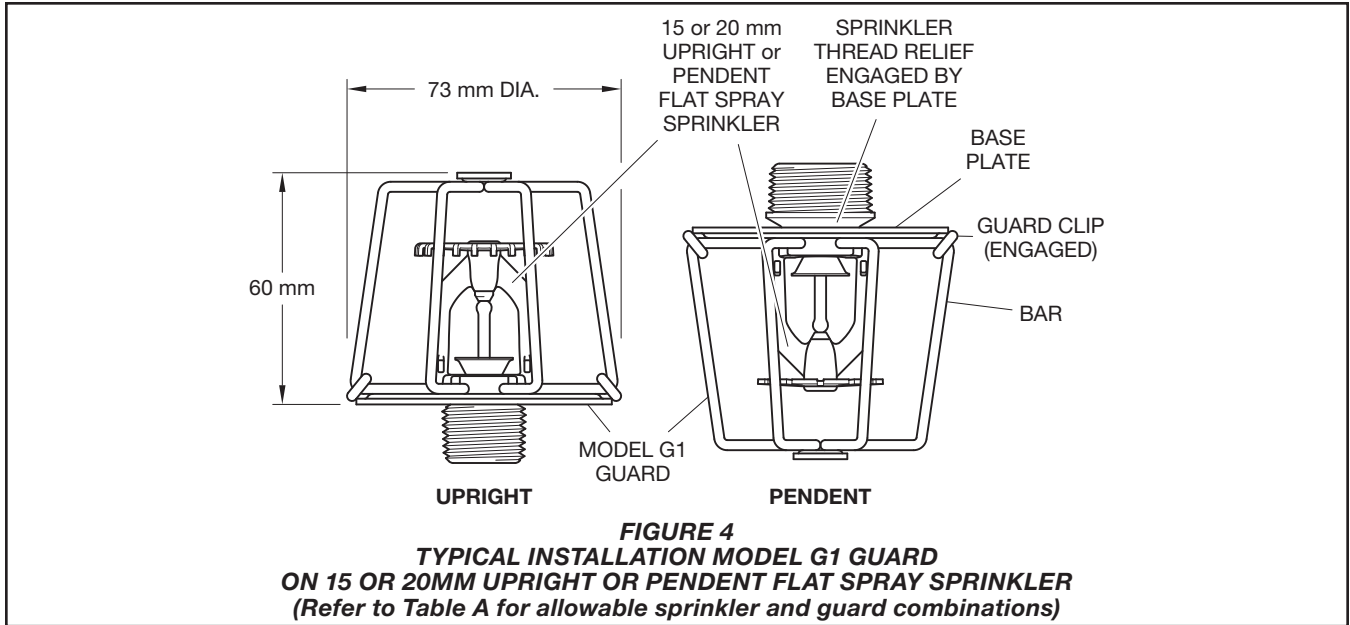
Bulb Glass
 Compression Screw Bronze
 Deflector Copper
 Guard Welded carbon steel
 Shield Carbon steel
 Shield Spring Carbon steel

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."





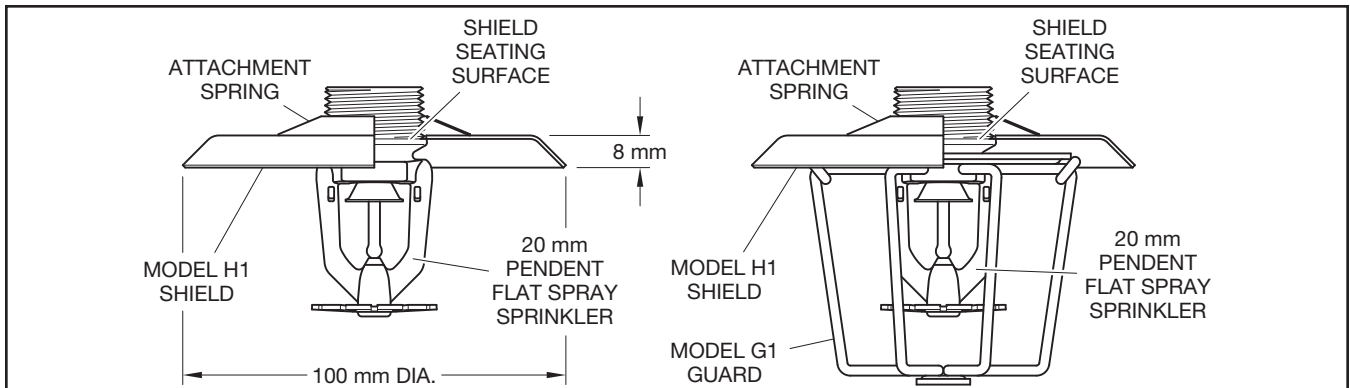


FIGURE 7
TYPICAL INSTALLATION MODEL H1 SHIELD OR MODEL H1 SHIELD WITH MODEL G1 GUARD
ON 20MM PENDENT FLAT SPRAY SPRINKLER
(Refer to Table A for allowable sprinkler, shield and guard combinations)

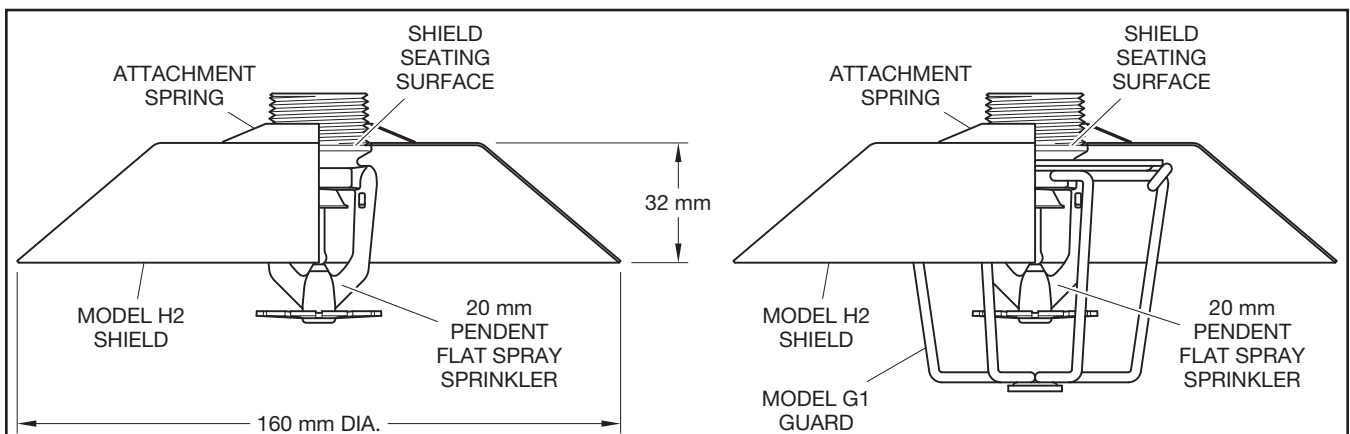


FIGURE 8
TYPICAL INSTALLATION MODEL H2 SHIELD OR MODEL H2 SHIELD WITH MODEL G1 GUARD
ON 20MM PENDENT FLAT SPRAY SPRINKLER
(Refer to Table A for allowable sprinkler, shield and guard combinations)

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:

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-R3/8 sprinkler joint should be obtained by applying a minimum-to-maximum torque of 8 to 16 Nm. A leak tight 1/2 inch NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 9,5 to 19,0 Nm. A leak tight 3/4 inch NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 13,4 to 26,8 Nm. 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 mounted on the sprinkler after the sprinkler has been installed in accordance with the "Sprinklers Only" subsection.

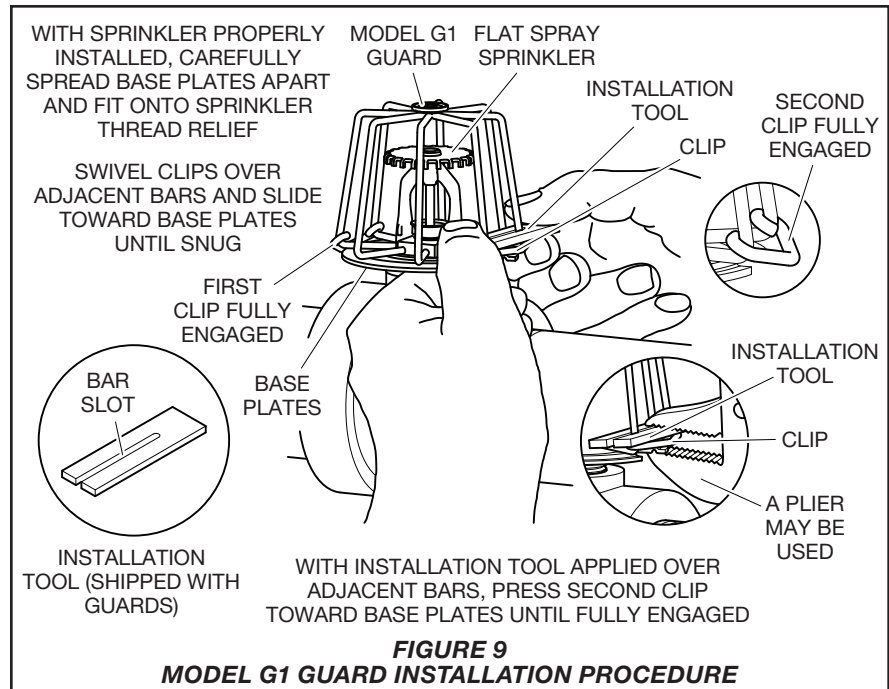
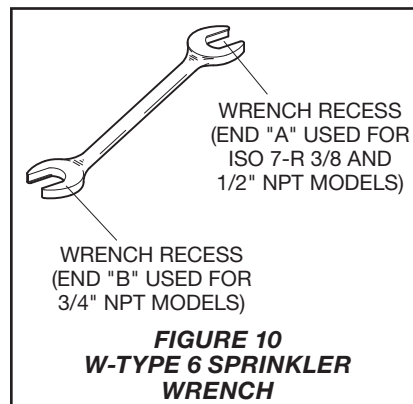


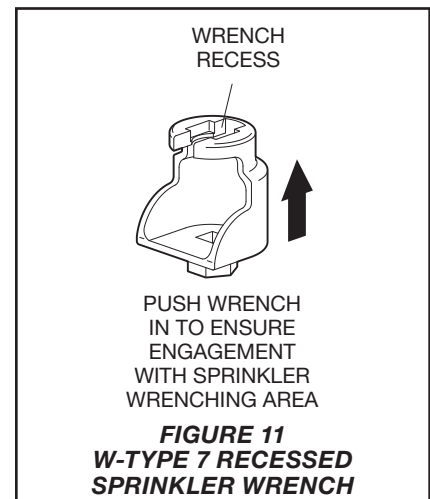
FIGURE 9
MODEL G1 GUARD INSTALLATION PROCEDURE



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



NOTES: 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

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 applied 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 Recessed 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 6. 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 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. (Ref. Installation Section).

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 sprinkler 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.

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.

Sprinklers

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 B)

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 G1 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.

P/N 51 — XXX — 1 — XXX

	MODEL/SIN	TYPE	SPRINKLER MATERIAL	TEMPERATURE RATING (Fluid Color)
382	TY-FRFS/TY1236	57K PENDENT, ISO 7-R 3/8	1 NATURAL BRASS	135 57°C (Orange)
370	TY-FRFS/TY3136	80K UPRIGHT, 1/2 INCH NPT		155 68°C (Red)
371	TY-FRFS/TY3236	80K PENDENT, 1/2 INCH NPT		175 79°C (Yellow)
390	TY-FRFS/TY4136	115K UPRIGHT, 3/4 INCH NPT		200 93°C (Green)
391	TY-FRFS/TY4236	115K PENDENT, 3/4 INCH NPT		286 141°C (Blue)
482	TY-FS Special/TY1246	57K PENDENT, ISO 7-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		
582	TY-FS/TY1256	57K PENDENT, ISO 7-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 B
PART NUMBER SELECTION
FLAT SPRAY SPRINKLERS