



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

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."

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.

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.

Sprinkler Identification Numbers (SINs)

Model TY-FRFS (3 mm Bulb)

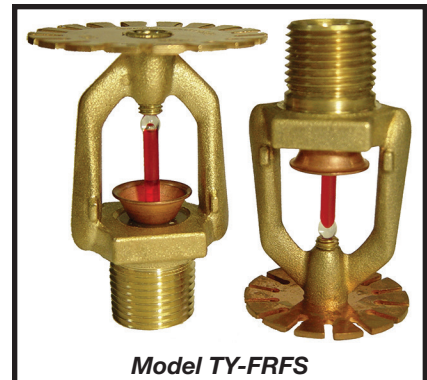
TY1136 – Upright K57
TY1236 – Pendent K57
TY3136 – Upright K80
TY3236 – Pendent K80
TY4136 – Upright K115
TY4236 – Pendent K115

Model TY-FS Special (4 mm Bulb)

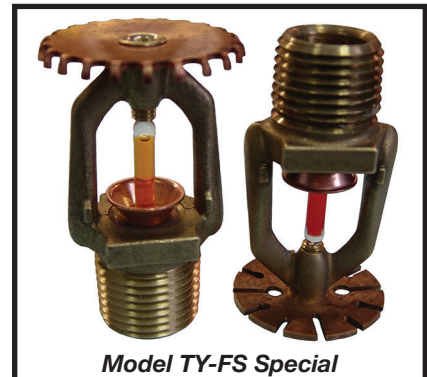
TY1146 – Upright K57
TY1246 – Pendent K57
TY3146 – Upright K80
TY3246 – Pendent K80
TY4146 – Upright K115
TY4246 – Pendent K115

Model TY-FS (5 mm Bulb)

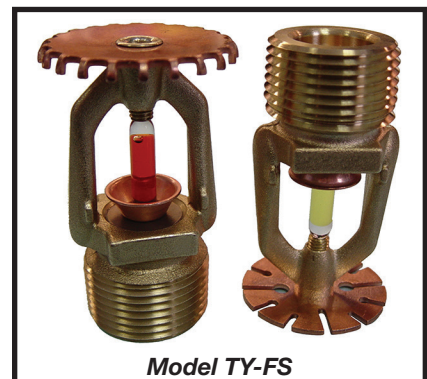
TY1156 – Upright K57
TY1256 – Pendent K57
TY3156 – Upright K80
TY3256 – Pendent K80
TY4156 – Upright K115
TY4256 – Pendent K115



Model TY-FRFS



Model TY-FS Special



Model TY-FS

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.

Series	Bulb Size	Orifice	Position	SIN	Approvals	Guard	Shield	Guard/Shield
TY-FRFS	3 mm	K57, 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	K80, 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	K115, 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

Technical Data

Approvals

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:
Johnson Controls
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 (°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
BulbGlass
Compression ScrewBronze
DeflectorCopper
GuardWelded Carbon Steel
ShieldCarbon 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*.

MODEL	BULB SIZE	SIN	
		UPRIGHT	PENDENT
TY-FRFS	3 mm	TY1136	TY1236
TY-FS SPECIAL	4 mm	TY1146	TY1246
TY-FS	5 mm	TY1156	TY1256

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

Components:

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

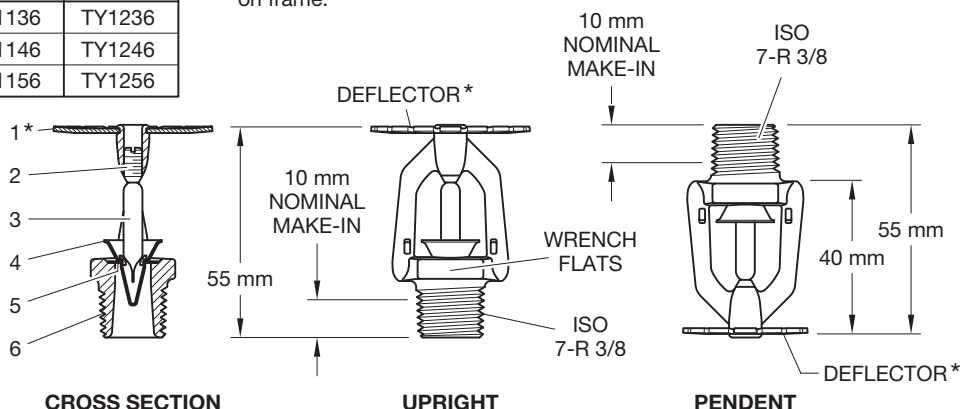


FIGURE 1
57 K-FACTOR, 10 MM ORIFICE, ISO 7-R 3/8 THREAD
UPRIGHT AND PENDENT FLAT SPRINKLERS

MODEL	BULB SIZE	SIN	
		UPRIGHT	PENDENT
TY-FRFS	3 mm	TY3136	TY3236
TY-FS SPECIAL	4 mm	TY3146	TY3246
TY-FS	5 mm	TY3156	TY3256

* 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

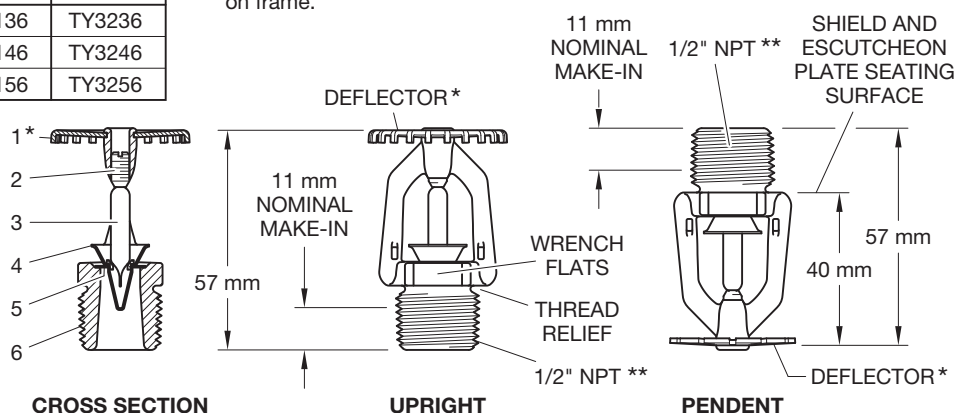


FIGURE 2
80 K-FACTOR, 15 MM ORIFICE, 1/2 INCH NPT THREAD
UPRIGHT AND PENDENT FLAT SPRINKLERS

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

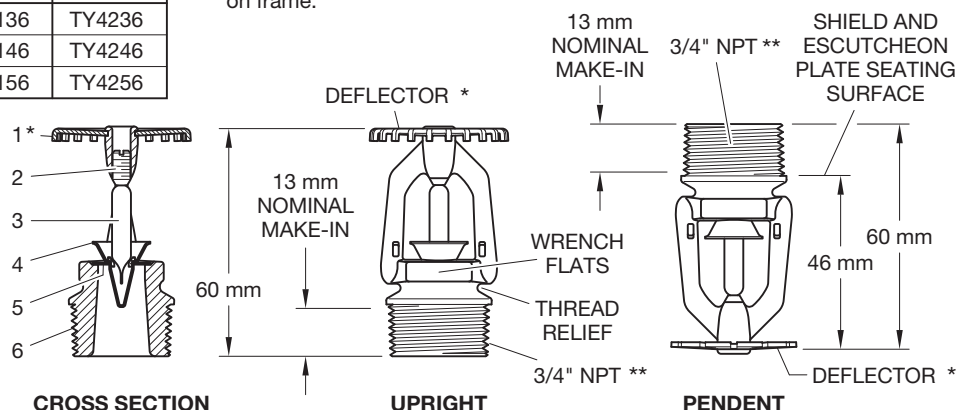


FIGURE 3
115 K-FACTOR, 20 MM ORIFICE, 3/4 INCH NPT THREAD
UPRIGHT AND PENDENT FLAT SPRINKLERS

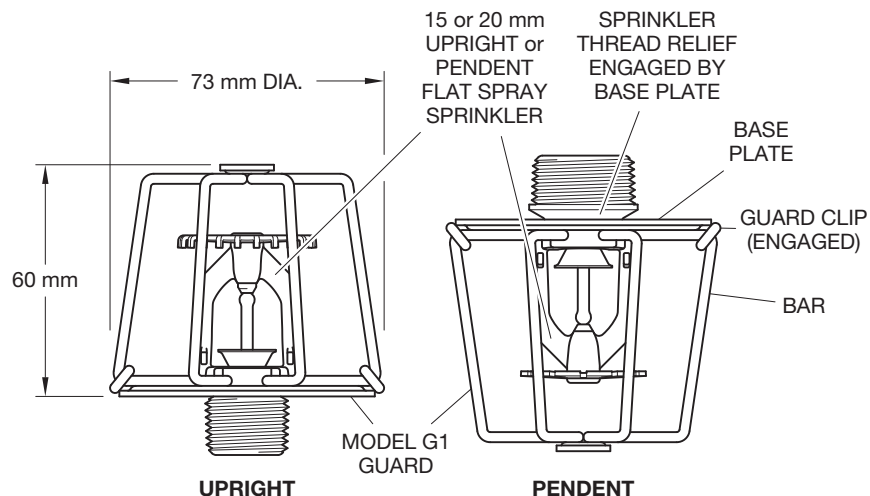


FIGURE 4
MODEL G1 GUARD
ON 15 OR 20MM UPRIGHT OR PENDENT FLAT SPRAY SPRINKLER – TYPICAL INSTALLATION
(Refer to Table A for allowable sprinkler and guard combinations)

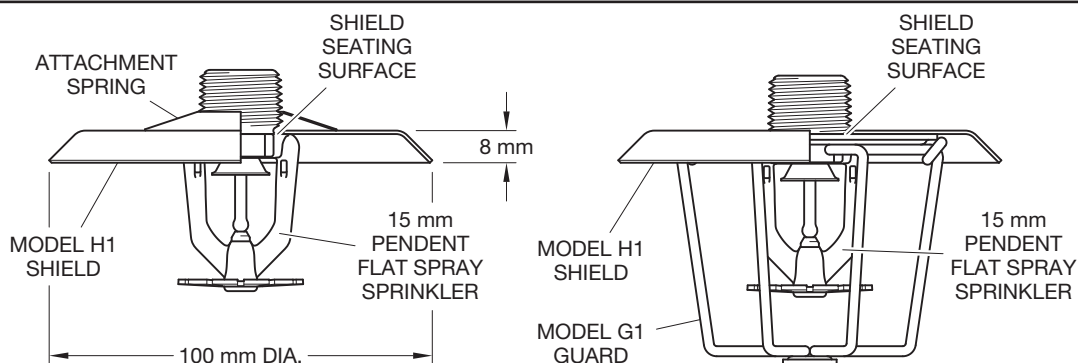


FIGURE 5
MODEL H1 SHIELD OR MODEL H1 SHIELD WITH MODEL G1 GUARD
ON 15MM PENDENT FLAT SPRAY SPRINKLER – TYPICAL INSTALLATION
(Refer to Table A for allowable sprinkler, shield and guard combinations)

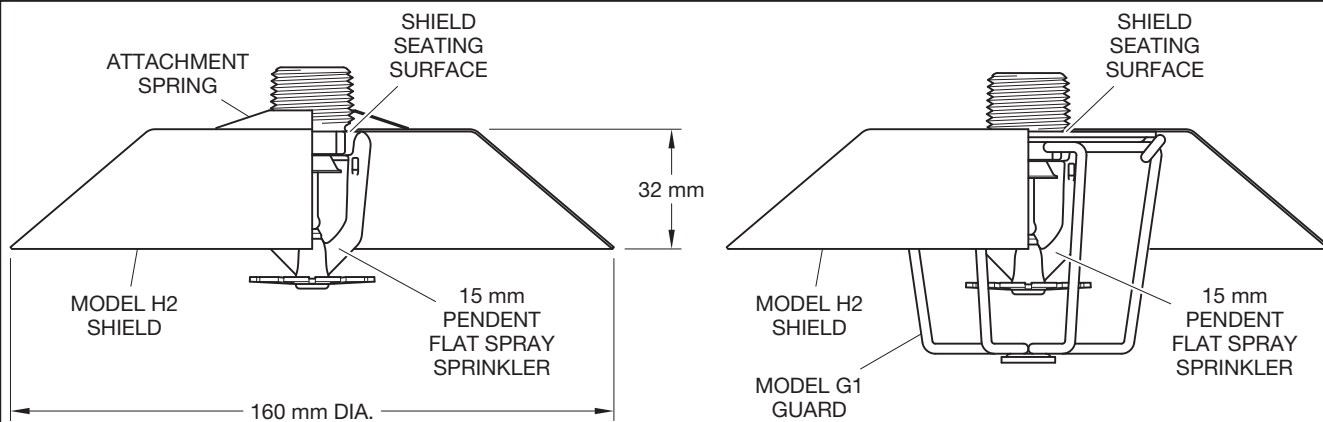


FIGURE 6
MODEL H2 SHIELD OR MODEL H2 SHIELD WITH MODEL G1 GUARD
ON 15MM PENDENT FLAT SPRAY SPRINKLER – TYPICAL INSTALLATION
(Refer to Table A for allowable sprinkler, shield and guard combinations)

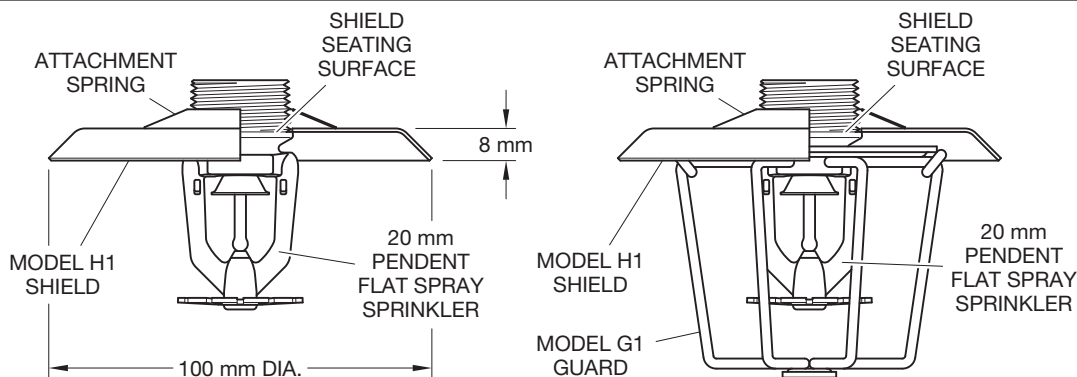


FIGURE 7
MODEL H1 SHIELD OR MODEL H1 SHIELD WITH MODEL G1 GUARD
ON 20MM PENDENT FLAT SPRAY SPRINKLER – TYPICAL INSTALLATION
(Refer to Table A for allowable sprinkler, shield and guard combinations)

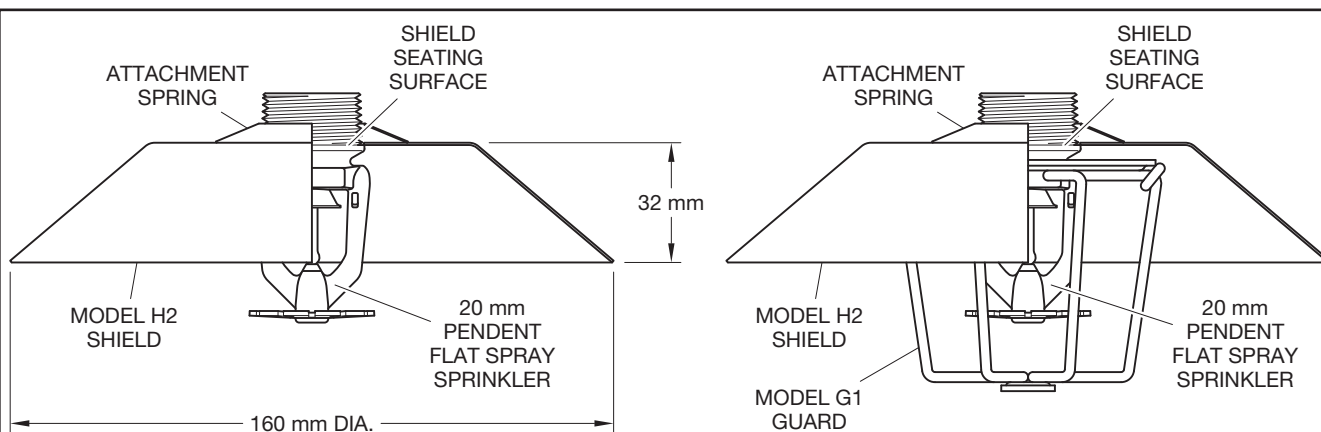


FIGURE 8
MODEL H2 SHIELD OR MODEL H2 SHIELD WITH MODEL G1 GUARD
ON 20MM PENDENT FLAT SPRAY SPRINKLER – TYPICAL INSTALLATION
(Refer to Table A for allowable sprinkler, shield and guard combinations)

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

Refer to 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

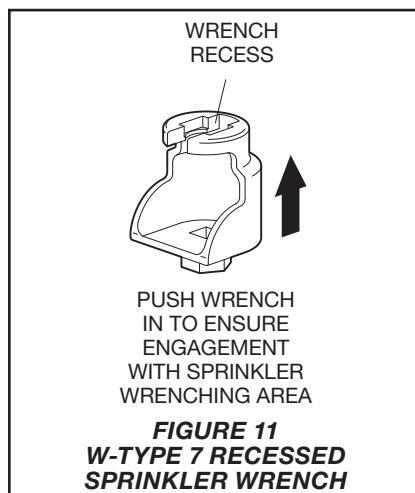
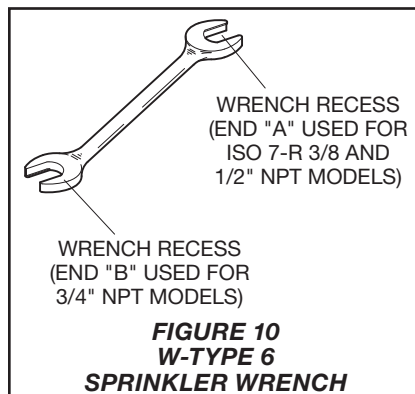
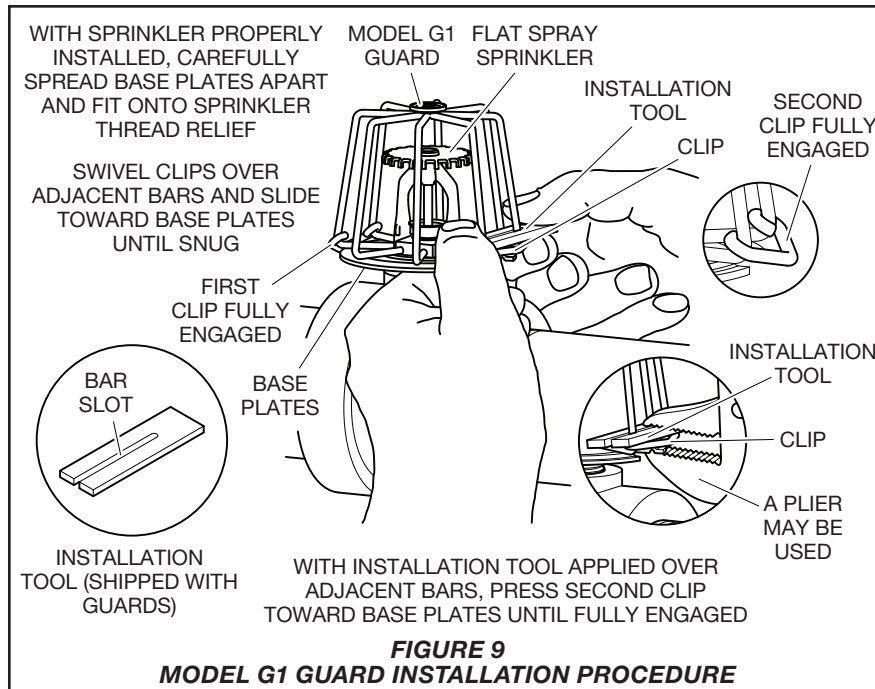
distort the sprinkler inlet and cause leakage or impairment of the sprinkler.

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 (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 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. (Ref. 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 (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 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 (Ref. 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.

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