

Model TFP1

4.2 K-Factor - Fast Response Residential



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General Description

The Model TFP1 Residential Flush Pendent Sprinklers are decorative fusible solder sprinklers designed for use in residential occupancies such as homes, apartments, dormitories, and hotels. When aesthetics is the major consideration, the Model TFP1 should be your first choice.

They are to be used in wet pipe residential sprinkler systems for one- and two-family dwellings and mobile homes per NFPA 13D; wet pipe residential sprinkler systems for residential occupancies up to and including four stories in height per NFPA 13R; or, wet pipe sprinkler systems for the residential portions of any occupancy per NFPA 13.

The Model TFP1 has a 4.2 (60,5) K-factor which provides very low design flow rates at reduced residual pressures, enabling smaller pipe sizes and water supply requirements.

The flush design of the Model TFP1 features a separable escutcheon providing 3/8 inch (9,5 mm) vertical adjustment. This adjustment reduces the accuracy to which the fixed pipe drops to the sprinklers must be cut to help assure a perfect fit installation.

The Model TFP1 has been designed with heat sensitivity and water distribution characteristics proven to help in the control of residential fires to improve the chance for occupants to escape or be evacuated. However, residential fire sprinkler systems are not a substitute for intelligent fire safety awareness or fire safety construction required by building codes.

WARNINGS

The Model TFP1 Residential Flush Pendent Sprinklers described herein must be installed and main-

tained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the integrity of these devices.

Because of the above cited stipulations and the varied nature of residential type architecture, there will be some compartment designs which cannot be fully sprinklered in accordance with the recommendations of NFPA 13, 13D, or 13R. In the event of this condition, consult the authorities having jurisdiction for guidance and approval.

It is the responsibility of the installing contractor to provide a copy of this document to the owner or his representative, and in turn, it is the obligation of the owner to provide a copy of this document to a succeeding owner.

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 relative to any questions.

Operation: The sprinkler assembly contains a small fusible solder element. When exposed to sufficient heat from a fire, the solder melts and enables the internal components of the sprinkler to fall away. At this point the sprinkler activates with the deflector dropping into its operated position (Reference Figure 1C), permitting water to flow.



Residential Flush Pendent Sprinkler

Technical Data

Sprinkler Identification Number:
TY2264

Approvals:
UL and C-UL Listed under the name of Tyco Fire Products. (With exception to the sloped ceiling criteria, the approvals apply only to the service conditions indicated in the Design Criteria section.)

Maximum Working Pressure:
175 psi (12,1 bar)

Discharge Coefficient:
 $K = 4.2 \text{ GPM/psi}^{1/2}$
(60,5 LPM/bar^{1/2})

Temperature Rating:
162°F/72°C

Adjustment:
3/8 inch (9,5 mm) vertical

Finishes:
Sprinkler and Escutcheon: White, Chrome

Physical Characteristic:
Dezincification resistant bronze body and copper gasketed orifice seal design.

MAXIMUM COVERAGE AREA ^(a) FT. x FT.	SINGLE SPRINKLER Minimum Flow ^(b) Residual Pressure	MULTIPLE SPRINKLERS Minimum Flow ^(b) Residual Pressure
	162°F	
12 x 12	11.5 GPM (43,5 LPM) 7.5 PSI (0,5 BAR)	11.5 GPM (43,5 LPM) 7.5 PSI (0,5 BAR)
14 x 14	11.5 GPM (43,5 LPM) 7.5 PSI (0,5 BAR)	11.5 GPM (43,5 LPM) 7.5 PSI (0,5 BAR)
16 x 16	14 GPM (53,0 LPM) 11.1 PSI (0,8 BAR)	14 GPM (53,0 LPM) 11.1 PSI (0,8 BAR)
18 x 18	18 GPM (68,1 LPM) 18.4 PSI (1,3 BAR)	16 GPM (60,6 LPM) 14.5 PSI (1,0 BAR)
20 x 20	23 GPM (87,1 LPM) 30.1 PSI (2,1 BAR)	20 GPM (75,7 LPM) 22.7 PSI (1,6 BAR)

(a) For coverage area dimensions less than or between those indicated, it is necessary to use the minimum required flow for the next highest coverage area for which hydraulic design criteria are stated.

(b) Requirement is based on minimum flow in GPM from each sprinkler. The associated residual pressures are calculated using the nominal K-factor. Refer to Hydraulic Design Criteria Section for details.

Table A
NFPA 13D and NFPA 13R
Hydraulic Design Criteria



The Model TFP1 Residential Flush Pendent Sprinklers must only be installed and utilized in accordance with the following described criteria which are provided by the manufacturer.

NOTES

Residential Fire Sprinkler Systems should only be designed and installed by those competent and completely familiar with automatic sprinkler system design, installation procedures, and techniques.

Several criteria may apply to the installation and usage of each sprinkler. Consequently, it is recommended that the sprinkler system designer review and develop a working understanding of the complete list of criteria prior to initiating the design of the sprinkler system.

Questions concerning sprinkler installation and usage criteria which are not covered by the following instructions should be submitted to Tyco Fire Products. Include sketches and technical details as appropriate.

In some instances, the requirements of this document may con-

cern specifications which are more stringent and which take precedence over those specified in NFPA 13, NFPA 13D, NFPA 13R, or by the authority having jurisdiction.

The spray from the sprinkler is distributed radially outward and downward from the sprinkler deflector. Consequently, the sprinklers must be located such that there will not be any blind spaces shielded from spray by partitions, room dividers, overhangs or other parts of the dwelling structure.

The number of sprinklers within each compartment (as defined by NFPA 13, 13D, or 13R), must be kept as few as possible. Do NOT use more sprinklers than necessary to cover a particular space.

Use only the escutcheon provided with the Model TFP1.

The sprinkler must be secured in position by firmly fastening the sprinkler system piping to the

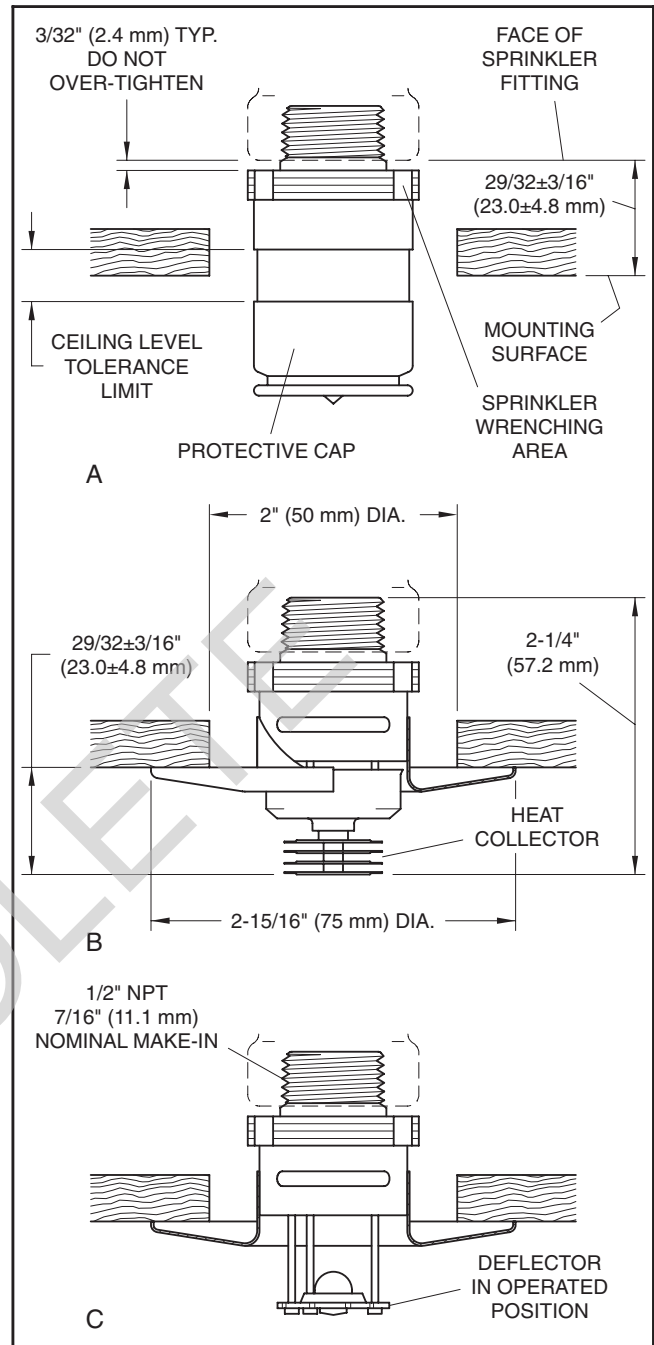


Figure 1
Model TFP1 Residential
Flush Pendent Sprinkler

structure. If the sprinkler is not properly secured in position, reaction forces resulting from sprinkler operation could alter its orientation and its water distribution pattern. The sprinkler escutcheon cannot be used to hold the sprinkler in position.

General Service Conditions. The Model TFP1 must only be utilized in wet pipe sprinkler systems.

Hydraulic Design Criteria. The minimum required single and multiple sprinkler flow rates for systems de-

signed to NFPA 13D or NFPA 13R are given in Table A as a function of temperature rating and the maximum allowable coverage areas. The single sprinkler flow rate is the minimum required discharge from the most hydraulically demanding single sprinkler and, the multiple sprinkler flow rate is the minimum required discharge from each of the total number of "design sprinklers" as specified in NFPA 13D or NFPA 13R.

TIA 99-1 (Tentative Interim Amendment) with an effective date of May 22, 2000 states that the minimum required discharge from each of the "design sprinklers" for systems designed to NFPA 13 must be calculated based on delivering a minimum design density of 0.1 gpm/sq. ft. for each of the listed coverage areas shown in Table A. Consult with the Authority Having Jurisdiction regarding the application of this TIA to the currently adopted NFPA 13.

For systems designed to NFPA 13, 13D, or 13R, consult with the local authority having jurisdiction with regard to the number of "design sprinklers" for sloped ceilings having a slope greater than a 2 inch rise for a 12 inch run.

Spray Coverage Criteria. Figure 2 and 3 provide spacing rules that must be followed to assure that the Model TFP1 Sprinklers will provide their design distribution of water spray.

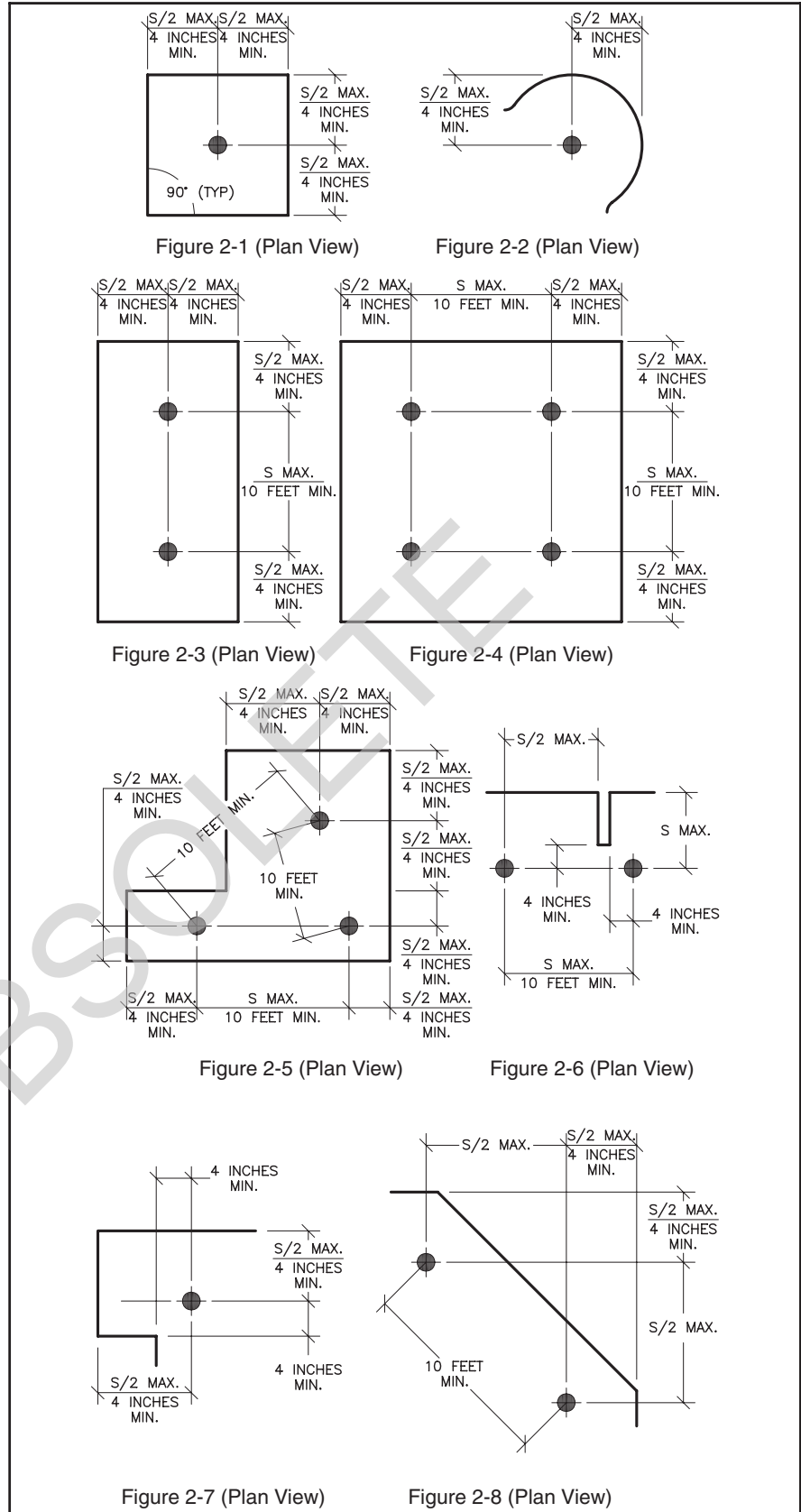
Location of sprinklers with respect to obstructions to water distribution are to be in accordance with the obstruction rules for extended coverage pendent sprinklers per the requirements of NFPA 13.

Operational Sensitivity Criteria. For proper operational sensitivity, the Model TFP1 must be installed beneath a solid ceiling having a smooth or textured surface.

The Model TFP1 must **NOT** be used above or below open-gridded type suspended ceilings; beneath soffits or beams exceeding 3 inches in height; or, with beams, joists, or ducts having a height of more than 3 inches located within the sprinkler coverage areas. Beams having a height of more than 3 inches may be located with their centerlines along the boundaries separating adjacent sprinkler coverage areas.

Cold Soldering Criteria. Figures 2 and 3 provide the minimum spacing requirements necessary for preventing the wetting (i.e., cold soldering) of the heat responsive element of a non-operated Model TFP1, which is adjacent to one which has operated.

Heat Source Criteria. Refer to



S = THE LENGTH OF THE COVERAGE AREA BEING HYDRAULICALLY CALCULATED (REF. TABLE A).

**Figure 2
Spacing Rules Under Level Ceilings**

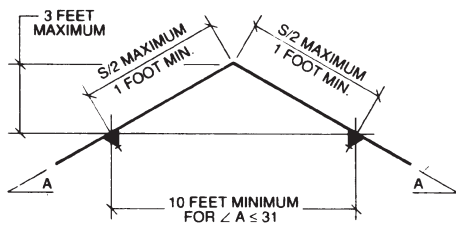


Figure 3-1 (Elevation View)

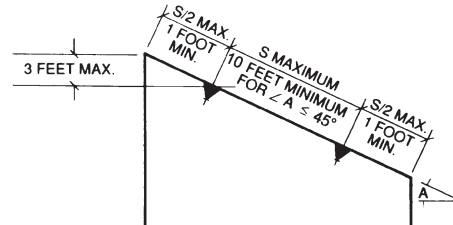


Figure 3-2 (Elevation View)

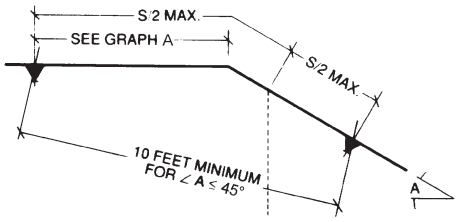


Figure 3-3 (Elevation View)

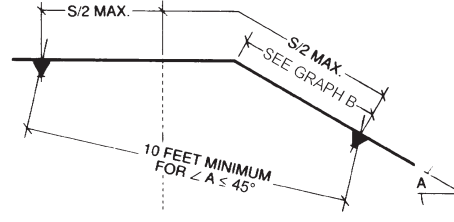


Figure 3-4 (Elevation View)

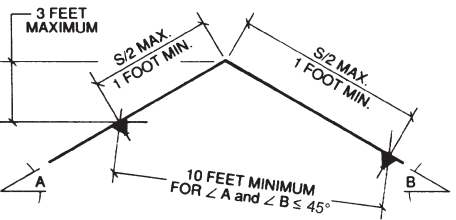


Figure 3-5 (Elevation View)

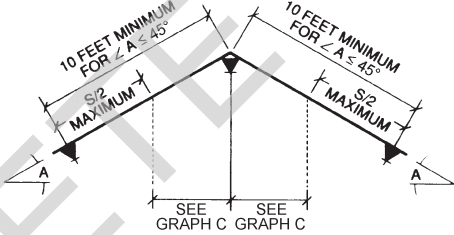


Figure 3-6 (Elevation View)

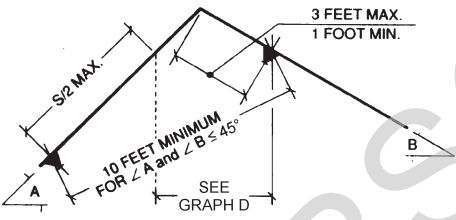


Figure 3-7 (Elevation View)

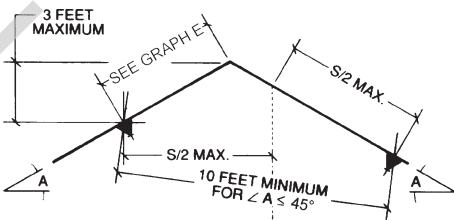


Figure 3-8 (Elevation View)

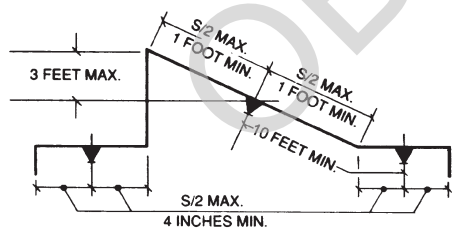


Figure 3-9 (Elevation View)

S/2 = ONE-HALF THE LENGTH OF THE COVERAGE AREA BEING HYDRAULICALLY CALCULATED (REF. TABLE A).

S = THE LENGTH OF THE COVERAGE AREA BEING HYDRAULICALLY CALCULATED (REF. TABLE A).

NOTE: Figures 3-1 through 3-9 only apply when:

- the ceiling ridge is horizontal;
- the compartment openings to adjoining spaces have minimum lintel depths of 8 inches below the lowest sprinkler;
- any adjacent sprinklers in the direction of the ceiling ridge are to be in a row which runs parallel to the ridge, and the sprinklers are to be spaced a minimum of 10 feet apart;
- the sprinklers shown in Figures 3-1 through 3-8 are located in a plane which is perpendicular to the ceiling ridge, and the ceiling angles are within the specified range.

Figure 3, Spacing Rules Under Pitched Ceilings and/or Overhangs

NFPA 13D or NFPA 13R for the requirements relating to preventing the possible release of a Model TFP1 heat responsive element, due to exposure to heat sources other than abnormal fire.

Installation

The Model TFP1 must be installed in accordance with the following instructions:

NOTES

The Protective Cap is to remain on the sprinkler during installation and until the ceiling installation is complete. The Protective Cap must be removed to place the sprinkler in service.

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 is to be used to install sprinklers. Higher levels of torque may distort the sprinkler inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in an Escutcheon Plate by under- or over-tightening the Sprinkler. Readjust the position of the sprinkler fitting to suit.

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

Step 2. Install the sprinkler fitting so that the distance from the face of the fitting to the mounting surface will be nominally 29/32 inches (23,0 mm) as shown in Figure 1A.

Step 3. With pipe thread sealant applied to the pipe threads, hand tighten the Sprinkler into the sprinkler fitting.

Step 4. Wrench tighten the Sprinkler using only the Sprinkler Socket or Wrench & Socket Combination (Ref. Figure 4). The wrench recess of the Socket is to be applied to the sprinkler wrenching area (Ref. Figure 1A).

Step 5. Use the “ceiling level tolerance limit” indicator on the Protective Cap to check for proper installation height. Relocate the sprinkler fitting as necessary. If desired the Protective Cap 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.

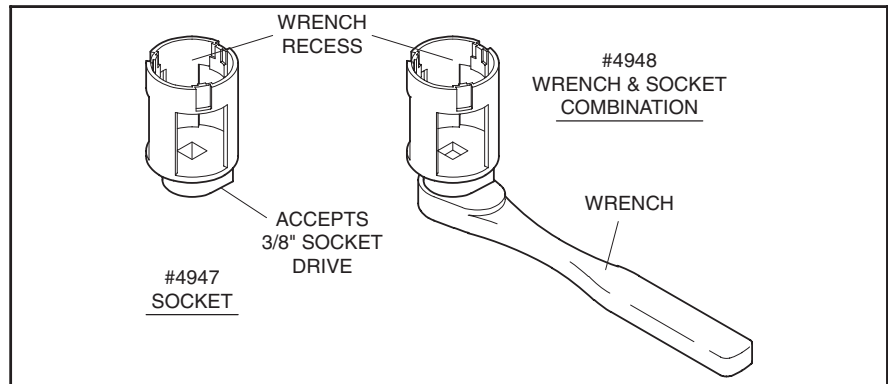


Figure 4
TFP1 Sprinkler Socket
TFP1 Wrench & Socket Combination

Step 6. After the ceiling has been completed with the 2 inch (50 mm) diameter clearance hole, use the Protective Cap Removal Tool (Ref. Figure 5) to remove the Protective Cap and then push on the Escutcheon until its flange just comes in contact with the ceiling. Do not continue to push on the Escutcheon such that it lifts a ceiling panel out of its normal position. If the Escutcheon cannot be engaged with the Sprinkler, or the the Escutcheon cannot be engaged sufficiently to contact the ceiling, relocate the sprinkler fitting as necessary.

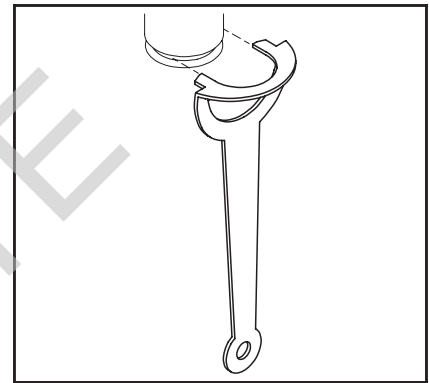


Figure 5
TFP1 Protective Cap
Removal Tool

Care and Maintenance

The Model TFP1 must be maintained and serviced in accordance with the following instructions:

NOTES

It is the responsibility of the installing contractor to provide a copy of this document to the owner or his representative, and in turn, it is the obligation of the owner to provide a copy of this document to a succeeding owner.

Wet pipe sprinkler systems must be maintained at a minimum temperature of 40°F/4°C to prevent freezing and bursting of the pipe and/or sprinklers.

Automatic sprinklers are not to be tested with a heat source. Operation of the heat responsive element can result.

Absence of an Escutcheon Plate may delay the time to sprinkler operation in a fire situation.

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.

Do NOT enclose sprinklers within drapes, curtains, or valances.

Do NOT hang anything from the sprinklers.

Do NOT cleanse the sprinklers with soap and water, detergents, ammonia, cleaning fluids, or other chemicals. Remove dust, lint, cobwebs, cocoons, insects, and larvae by gently brushing with a feather duster or gently vacuuming with a soft bristle (i.e., dusting) brush attachment.

Exercise suitable safety precautions in the use and storage of highly flammable materials. The rapid rate of fire development and spread of which can be caused by such materials can reduce the ability of the sprinkler system to aid in the control of a fire in which they are involved.

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

Automatic sprinklers must never be shipped or stored where its temperature will exceed 100°F/38°C and they 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/slip-page, or the like, must be replaced.

The Model TFP1 must only be replaced with pendent sprinklers which are listed for residential fire protection service and which have the same nominal K-factor, the same coverage area, and the same or lower flow ratings (as indicated under "Hydraulic Design Criteria").

When remodeling, such as by adding false beams or light fixtures or changing the location of compartment walls, first verify that the new construction will not violate the installation requirements stated under WARNINGS. Alter the new construction and/or the sprinkler system to suit the requirements of this document.

The owner is responsible for the inspection, testing, and maintainance 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 (e.g., NFPA 25), in addition to the 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.



Limited Warranty

Products manufactured by Tyco Fire Products 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 Tyco Fire Products. No warranty is given for products or components manufactured by companies not affiliated by ownership with Tyco Fire Products 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 applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by Tyco Fire Products to be defective shall be either repaired or replaced, at Tyco Fire Products' sole option. Tyco Fire Products neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. Tyco Fire Products 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 TYCO FIRE PRODUCTS 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 TYCO FIRE PRODUCTS WAS INFORMED ABOUT THE POSSIBILITY OF SUCH DAMAGES, AND IN NO EVENT SHALL TYCO FIRE PRODUCTS' 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.



Ordering Procedure

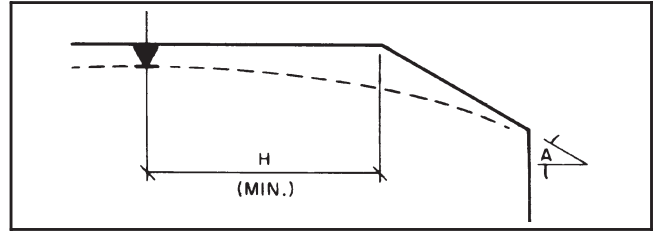
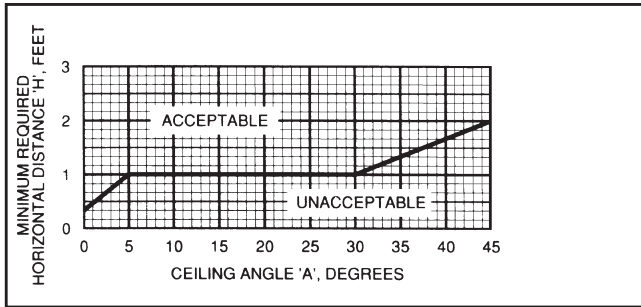
Please Specify:
Sprinkler Assembly:

- Model TFP1, K=4.2, Residential Flush Pendent Sprinkler

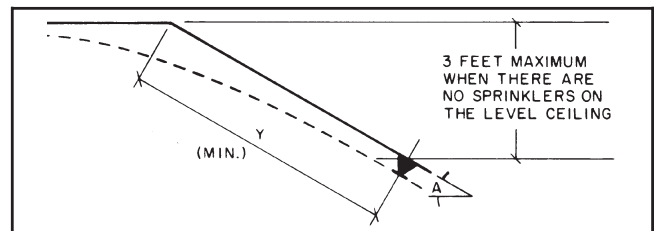
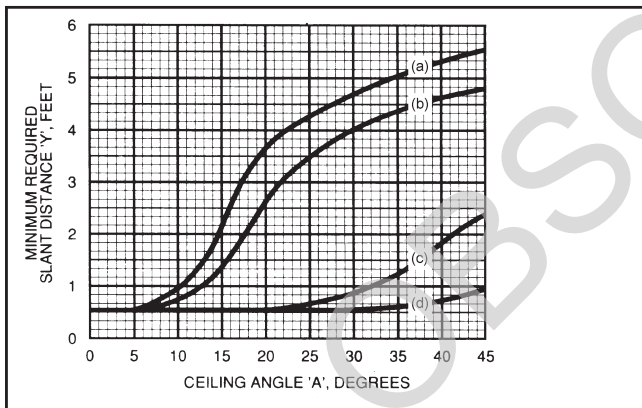
Accessories:

- Socket
- Wrench & Socket
- Protective Cap Removal Tool

Refer to Price List for a complete listing of Part Numbers with respect to temperature ratings, finishes, replacement escutcheons, etc.



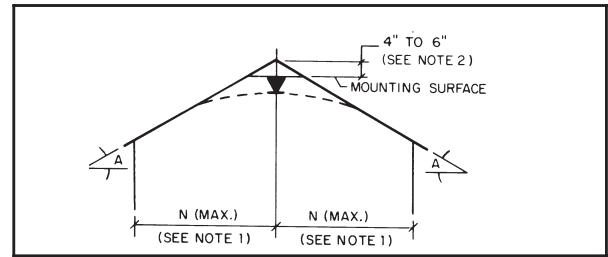
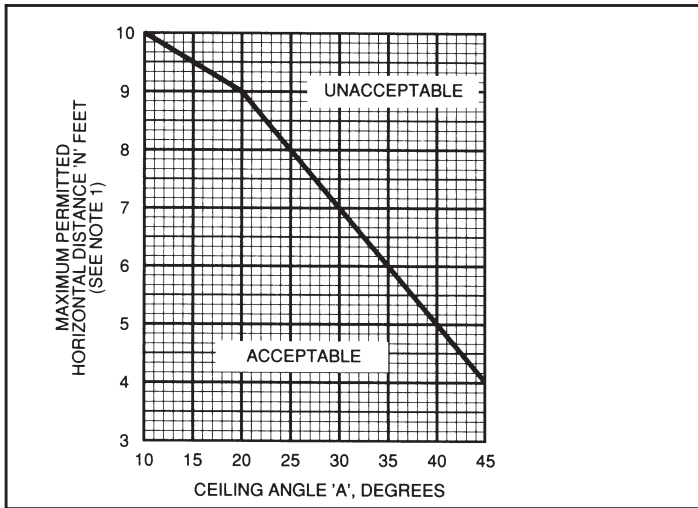
Graph A
Minimum Required Horizontal Distance
Between A Sprinkler Located On A Level
Ceiling And An Interesting Pitched Ceiling Without Unduly Obstructing
The Water Distribution



COVERAGE AREAS:

- (a) 20' x 20' (c) 16' x 16'
- (b) 18' x 18' (d) 14' x 14' & 12' x 12'

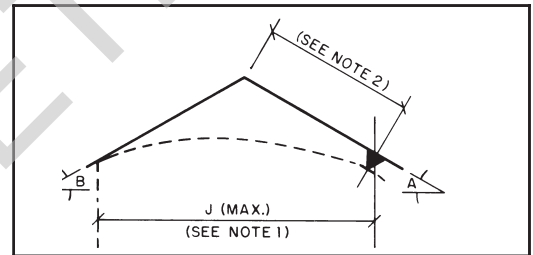
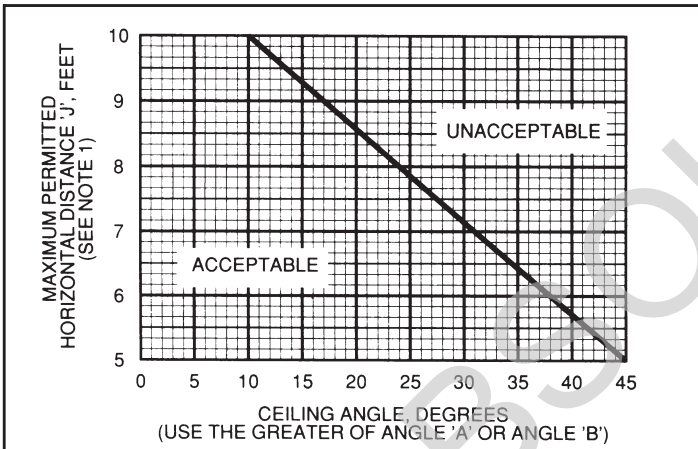
Graph B
Minimum Required Slant Distance Between A Level Ceiling And A Sprinkler Located
On A Pitched Ceiling Without Unduly Obstructing The Water Distribution Located On
An Intersecting Pitched Ceiling



NOTES:

1. UP TO A MAXIMUM OF ONE-HALF THE LENGTH OF THE COVERAGE AREA BEING HYDRAULICALLY CALCULATED.
2. THE MOUNTING SURFACE MUST BE LOCATED WITHIN 4 TO 6 INCHES OF THE PEAK, IF IT IS NOT CONTINUOUS OVER THE FULL LENGTH OF THE CEILING RIDGE.

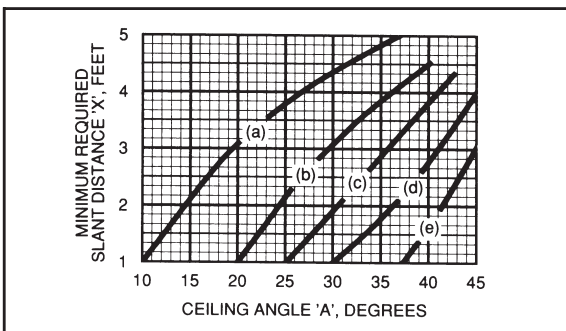
Graph C
Maximum Water Spray Distribution When A Sprinkler Is Located At A Peak



NOTES:

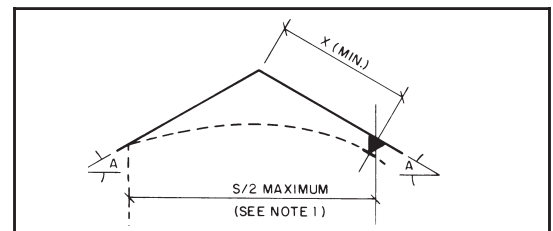
1. UP TO A MAXIMUM OF ONE-HALF THE LENGTH OF THE COVERAGE AREA BEING HYDRAULICALLY CALCULATED.
2. 3 FEET IS THE MAXIMUM PERMITTED AND 1 FOOT IS THE MINIMUM REQUIRED.

Graph D
Maximum Water Spray Distribution When A Sprinkler Is Located On A Pitched Ceiling Opposite From An Intersecting Pitched Ceiling



COVERAGE AREAS:

- (a) 20' x 20'
- (b) 18' x 18'
- (c) 16' x 16'
- (d) 14' x 14'
- (e) 12' x 12'



NOTE:

UP TO A MAXIMUM OF ONE-HALF THE LENGTH OF THE COVERAGE AREA BEING HYDRAULICALLY CALCULATED.

Graph E
Minimum Required Slant Distance Between A Ridge And A Sprinkler Without Unduly Obstructing The Water Distribution