

Model FH-1 Flexible Hose Assembly Lengths: 2.3 to 5.9 Feet (700 to 1800 mm)

General Description

TYCO Model FH-1 Flexible Hose can be used in wet sprinkler systems between the branchline and sprinkler when installed in accordance with NFPA 13, 13D, and 13R. Flexible Hose provides a unique sprinkler drop assembly comprised of the following components:

- Stainless steel flexible hose with two slip nuts
- Branchline inlet nipple
- Straight sprinkler reducer
- Reducer bracket, bar fixing clamps, and support bar

Using Model FH-1 Flexible Hose saves time and cost because the system can be installed in false ceilings without cutting and threading pipes associated with installing a drop, arm-over, and elbows. Model FH-1 Flexible Hose makes it possible to test and charge the system with water before installing the ceiling grid. After the ceiling grid is in position, the Model FH-1 Flexible Hose can be reshaped to suit the final sprinkler location without draining the system.

Model FH-1 Flexible Hose is installed quickly without large and expensive tools. Ideal applications include offices, schools, libraries, hospitals, and shopping complexes.

NOTICE

Model FH-1 Flexible Hose described herein must be installed and maintained in compliance with this document and 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.

Owners are 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.

Technical Data

Approvals

UL Listed

Refer to Table 1.

Nominal Assembly Lengths

- 2.3 feet (700 mm)
- 3.3 feet (1000 mm)
- 3.9 feet (1200 mm)
- 4.9 feet (1500 mm)
- 5.9 feet (1800 mm)

Refer to Figure 1.

Styles

Braided and Unbraided

Inlet Connections

ISO 7/1-R 1

Refer to Figure 4.

Outlet Connections

- 1/2 inch NPT
- 3/4 inch NPT

Refer to Figure 4.

Maximum Service Pressure

- Braided: 200 psi (13,8 bar)
- Unbraided: 175 psi (12,1 bar)

Maximum Ambient Temperature

225°F (107°C)

Discharge Coefficient

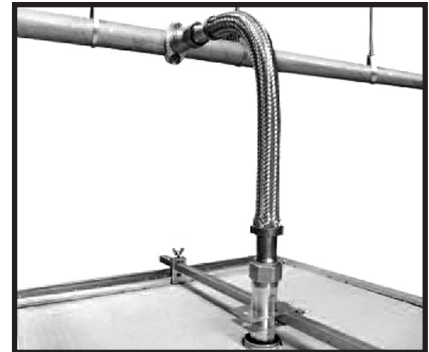
Refer to Table 1.

Minimum Installation

Bend Radius

6 inches (150 mm)

Refer to Figure 3.



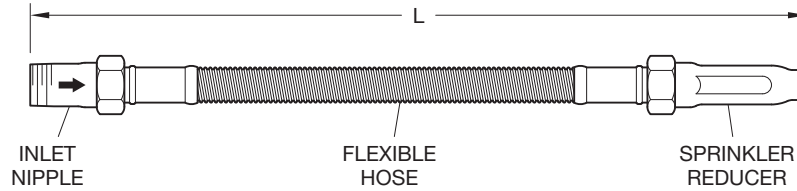
Bending Angles (Flow Direction)

Up to 180 degrees

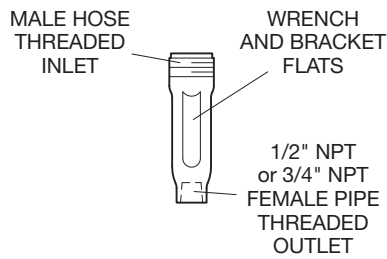
Materials of Construction

The Flexible Hose is AISI (American Iron and Steel Institute) Type 304 Stainless Steel. The connection at each end of the Flexible Hose utilizes a Slip Nut, NBR O-Ring, and Nylon 66 Washer. The Inlet Nipple, Sprinkler Reducer, the Reducer Bracket, Bar Fixing Clamps, and Support Bar are Steel.

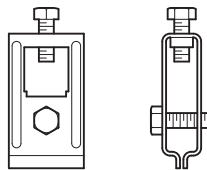
MODEL		NOMINAL LENGTH
UNBRAIDED	BRAIDED	L
TYFH-O-1-0700	TYFH-T-1-0700	2.3' (700 mm)
TYFH-O-1-1000	TYFH-T-1-1000	3.3' (1000 mm)
TYFH-O-1-1200	TYFH-T-1-1200	3.9' (1200 mm)
TYFH-O-1-1500	TYFH-T-1-1500	4.9' (1500 mm)
TYFH-O-1-1800	TYFH-T-1-1800	5.9' (1800 mm)



HOSE ASSEMBLIES



SPRINKLER REDUCER



BAR FIXING CLAMP

FIGURE 1
MODEL FH-1 FLEXIBLE HOSE
— NOMINAL DIMENSIONS —

Part Number	Outlet Connection (NPT)	Maximum Allowable K-Factor	Assembly Length Feet (mm)	Maximum Number of 90° Bends	Minimum Bend Radius Inches	Equivalent Length of Schedule 40 Steel Pipe C= 120 Feet
200 psi (13,8 bar), 1/2-Inch NPT						
TYFH-T-1-0700	1/2	8.0 GPM/psi ^{1/2} (115,2 LPM/ psi ^{1/2})	2.3 (700 mm)	1	6	12
TYFH-T-1-1000	1/2	8.0 GPM/psi ^{1/2} (115,2 LPM/ psi ^{1/2})	3.3 (1000 mm)	1	6	17
TYFH-T-1-1200	1/2	8.0 GPM/psi ^{1/2} (115,2 LPM/ psi ^{1/2})	3.9 (1200 mm)	2	6	43
TYFH-T-1-1500	1/2	8.0 GPM/psi ^{1/2} (115,2 LPM/ psi ^{1/2})	4.9 (1500 mm)	2	6	53
TYFH-T-1-1800	1/2	8.0 GPM/psi ^{1/2} (115,2 LPM/ psi ^{1/2})	5.9 (1800 mm)	2	6	65
200 psi (13,8 bar), 3/4-Inch NPT						
TYFH-T-3-0700	3/4	16.8 GPM/psi ^{1/2} (241,9 LPM/ psi ^{1/2})	2.3 (700 mm)	1	6	22
TYFH-T-3-1000	3/4	16.8 GPM/psi ^{1/2} (241,9 LPM/ psi ^{1/2})	3.3 (1000 mm)	1	6	35
TYFH-T-3-1200	3/4	16.8 GPM/psi ^{1/2} (241,9 LPM/ psi ^{1/2})	3.9 (1200 mm)	2	6	39
TYFH-T-3-1500	3/4	16.8 GPM/psi ^{1/2} (241,9 LPM/ psi ^{1/2})	4.9 (1500 mm)	2	6	47
TYFH-T-3-1800	3/4	16.8 GPM/psi ^{1/2} (241,9 LPM/ psi ^{1/2})	5.9 (1800 mm)	2	6	53
175 psi (12,1 bar), 1/2-Inch NPT						
TYFH-O-1-0700	1/2	5.6 GPM/psi ^{1/2} (80,6 LPM/ psi ^{1/2})	2.3 (700 mm)	1	6	12
TYFH-O-1-1000	1/2	5.6 GPM/psi ^{1/2} (80,6 LPM/ psi ^{1/2})	3.3 (1000 mm)	1	6	17
TYFH-O-1-1200	1/2	5.6 GPM/psi ^{1/2} (80,6 LPM/ psi ^{1/2})	3.9 (1200 mm)	2	6	43
TYFH-O-1-1500	1/2	5.6 GPM/psi ^{1/2} (80,6 LPM/ psi ^{1/2})	4.9 (1500 mm)	2	6	53
TYFH-O-1-1800	1/2	5.6 GPM/psi ^{1/2} (80,6 LPM/ psi ^{1/2})	5.9 (1800 mm)	2	6	65
175 psi (12,1 bar), 1/2-Inch NPT						
TYFH-O-3-0700	3/4	11.2 GPM/psi ^{1/2} (161,3 LPM/ psi ^{1/2})	2.3 (700 mm)	1	6	22
TYFH-O-3-1000	3/4	11.2 GPM/psi ^{1/2} (161,3 LPM/ psi ^{1/2})	3.3 (1000 mm)	1	6	35
TYFH-O-3-1200	3/4	11.2 GPM/psi ^{1/2} (161,3 LPM/ psi ^{1/2})	3.9 (1200 mm)	2	6	39
TYFH-O-3-1500	3/4	11.2 GPM/psi ^{1/2} (161,3 LPM/ psi ^{1/2})	4.9 (1500 mm)	2	6	47
TYFH-O-3-1800	3/4	11.2 GPM/psi ^{1/2} (161,3 LPM/ psi ^{1/2})	5.9 (1800 mm)	2	6	53

Notes

All Part Numbers have a Maximum Ambient Temperature of 225°F (107°C) and a Flexibility Type of Limited. These fittings are intended for use in hydraulically designed sprinkler systems. The hydraulic loss of these fittings needs to be included in hydraulic design calculations. Losses vary depending upon the installed configuration. This table provides the maximum allowable number of bends with a minimum bend radius of 6 inches (150 mm) for each model and associated pressure losses expressed in equivalent length of 1-inch diameter Schedule 40 Steel Pipe, in feet, where C equals 120.

**TABLE 1
MODEL FH-1 FLEXIBLE HOSE
– UL DESIGN CRITERIA –**

Design Criteria

The following items must be considered and applied accordingly for TYCO Model FH-1 Flexible Hose installations.

Model FH-1 Flexible Hose can be used in wet sprinkler systems between the branchline and sprinkler when installed in accordance with NFPA 13, 13D, and 13R.

Hose and fittings have limited flexibility and are intended for direct connection to sprinklers in accordance with NFPA 13, 13D, or 13R.

Referenced by IBC (International Building Code), these connections are designed for use in ceilings with grids that meet the following standards:

- ASTM C 635 (Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings)
- ASTM C 636 (Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels)

Model FH-1 Hose connections have been approved for use in all Intermediate-Duty and Heavy-Duty structural classifications.

Installation

TYCO Model FH-1 Flexible Sprinkler Hose must be installed in accordance with the following instructions.

NOTICE

Flexible Hoses are intended only to connect sprinklers directly to system piping; for an example, refer to Figure 4. Flexible Hoses cannot be joined together to form longer hoses. Joining Flexible Hoses together creates an assembly with “unknown performance” that has not been accounted for in system calculations or safe product performance.

During and after installation, ensure that any sharp-edged material or tool does not damage the surface of the flexible hose.

1. Refer to the relative regulations, codes, or standards for guidance and determination of the desirable location for the unit in use; for example, commercial ceilings, clean rooms, and duct systems.
2. Review the Design Criteria section and Figures 2 - 4 that provide installation and assembly guidance.
3. Install the 1-inch Flexible Hose Inlet Nipple into the 1-inch Branchline Fitting Outlet.

Ensure that the arrow is in the appropriate direction of flow to the sprinkler. Use pipe-thread sealant at the connection to the Branchline Fitting Outlet.

Applying the wrench to the Slip Nut, attach the Inlet Nipple to the Flexible Hose. Tighten to a torque of 9 ft.-lbs. (12.26 Nm). Higher levels of torque can damage the O-Ring inside the fitting.

4. Determine the approximate location of the Sprinkler, which should be as close as possible to the center of the distance between the Ceiling Grid T-Bars.
5. Select the appropriate Support Bar length in accordance with the spacing between ceiling supports, both main bars and cross bars, 2 to 4 feet (600 to 1200 mm).
6. Slide the Reducer Bracket onto the Support Bar. Loosely attach the Reducer Bracket and the two Bar Fixing Clamps to the Support Bar.
7. Using the Bar Fixing Clamps, attach the Support Bar, which should cross the location of the sprinkler, to the Ceiling Grid T-Bar. At this step of installation, fasten bolts loosely to a torque of 2 ft.-lbs. (2.7 Nm).

8. Applying the wrench to the Slip Nut at the outlet end of the Flexible Hose, attach the Sprinkler Reducer to the Flexible Hose. Tighten to a torque of 9 ft.-lbs. (12.26 Nm).
9. Bend the Flexible Hose into a curve(s) that locates the Sprinkler Reducer at the other end of the Flexible Hose, in the area where the sprinkler will be located. Do not twist the tube arc, and ensure that the arc is large and smooth. Adhere to a minimum installation bending radius of 6 inches.

For longer Flexible Hose, intermediate support is recommended to secure movement of the flexible hose.

NOTICE

For minimum bend criteria, refer to the Technical Data section. Agency listing is based on this criteria.

A bend radius smaller than provided by the minimum bend criteria may adversely effect the friction loss specifications stated by the approval laboratory.

Verify that the Sprinkler Reducer is correctly located before securing the Reducer Bracket. Adjust the Sprinkler Reducer by moving it vertically and horizontally along the Support Bar. Tighten all bolts securely and evenly by applying a torque of 4.2 ft.-lbs. (5.6 Nm).

10. Attach the Sprinkler to the Sprinkler Reducer. Place a wrench on the Sprinkler Reducer to counteract the tightening torque and to prevent the Flexible Hose from twisting. Reference the Sprinkler manufacturer's data sheets for appropriate sprinkler tightening torque, sprinkler wrench, and other installation guidance.
11. Verify that the Sprinkler Reducer is seated in the Reducer Bracket. Precisely locate the Sprinkler in all three axes in accordance with the Sprinkler manufacturer's data sheet. Tighten the Screws on the Bar Fixing Clamps and the Reducer Bracket. The tightening torque for fasteners on the Bar Fixing Clamp and the Reducer Bracket is 4.2 ft.-lbs. (5,7 Nm).
12. After tightening all Screws, verify that the Sprinkler is properly located in accordance with the manufacturer's instructions. If not, loosen the Screws and re-adjust as required.

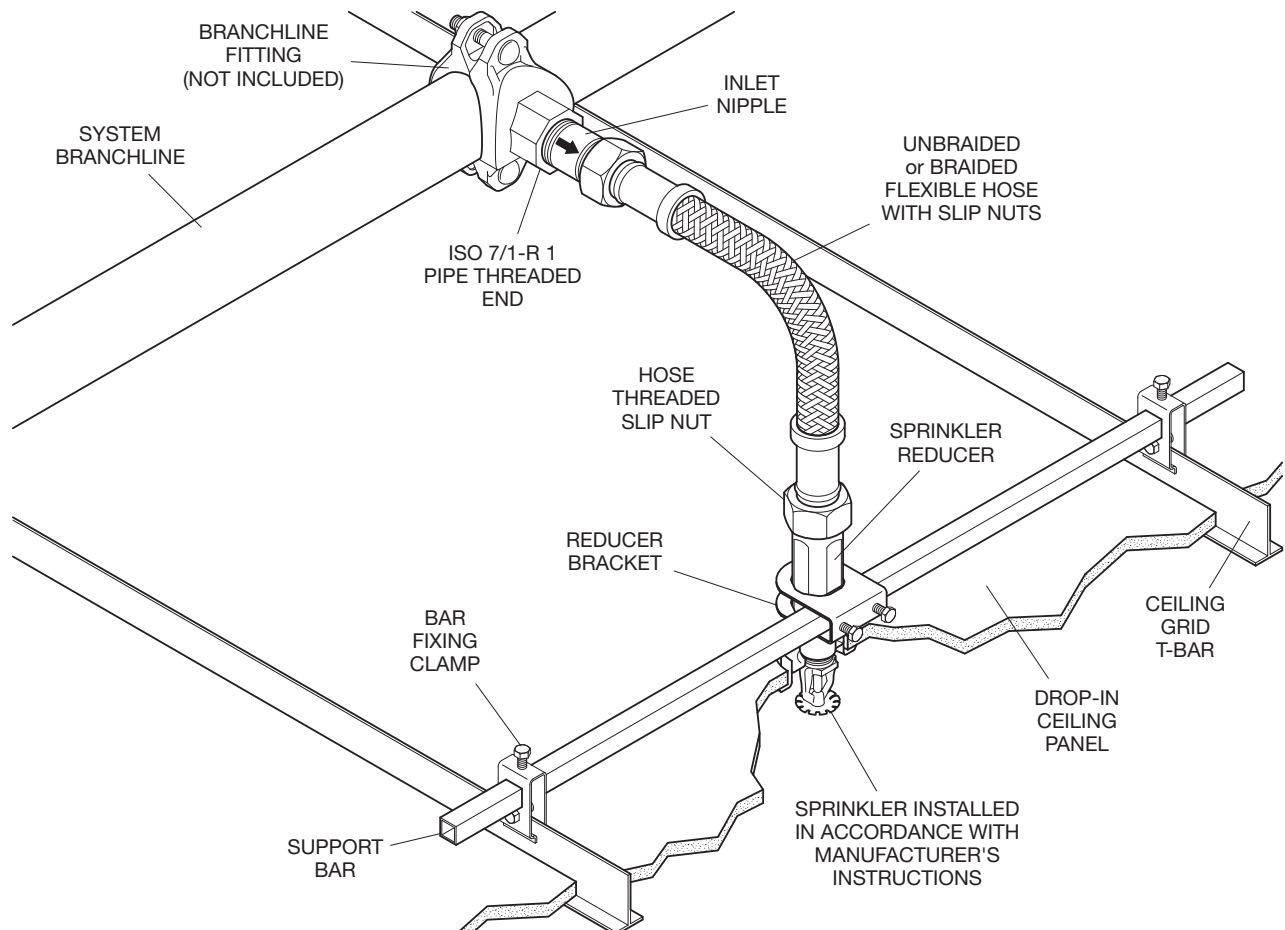
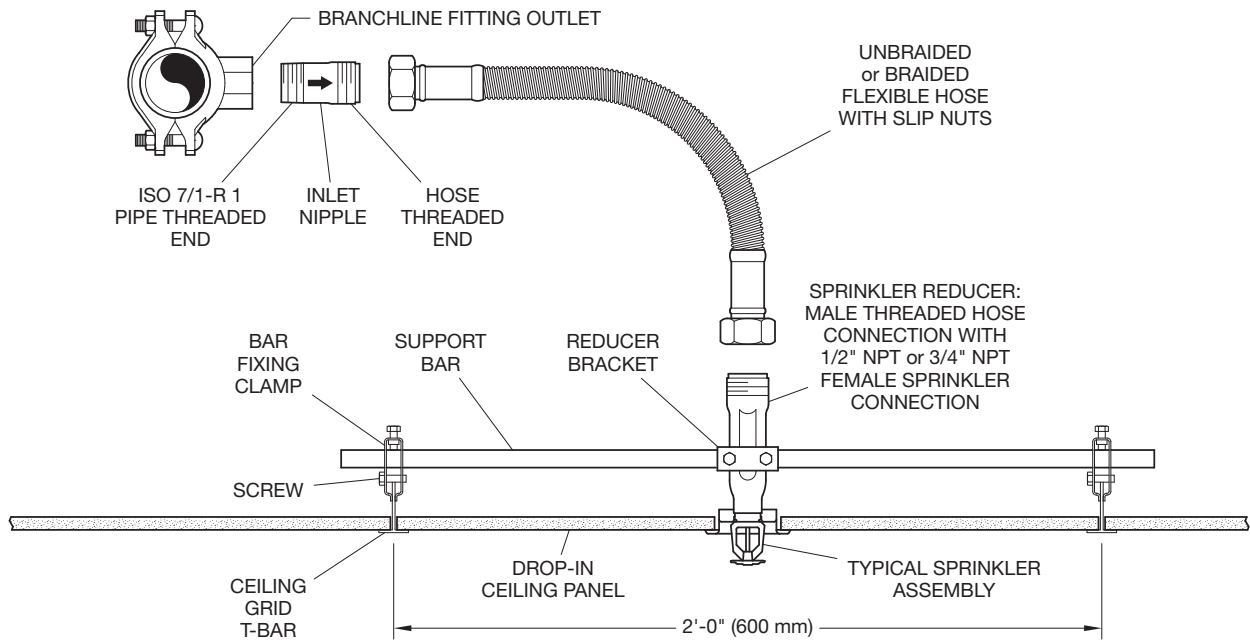
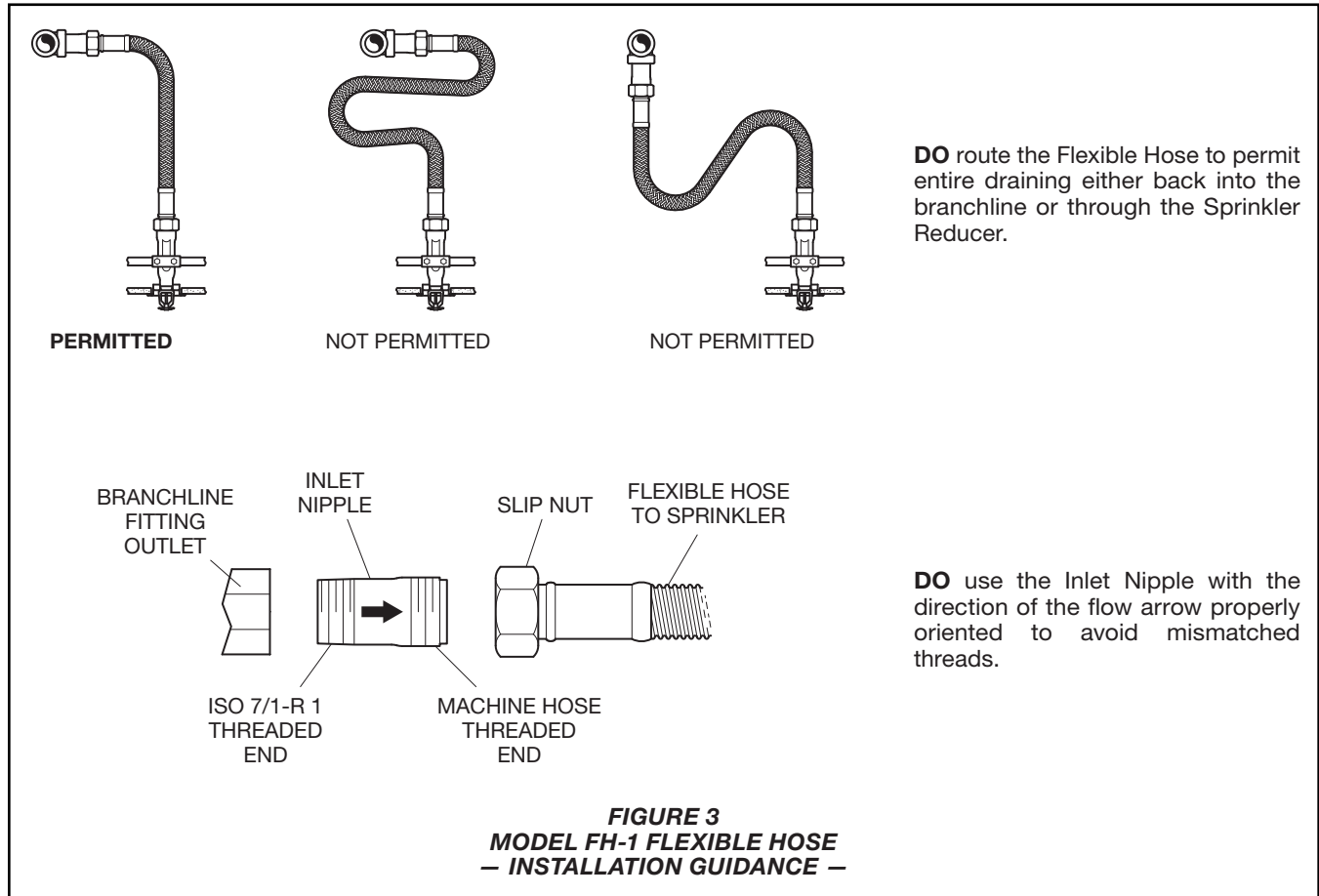


FIGURE 2
MODEL FH-1 FLEXIBLE HOSE
- ASSEMBLY -



Care and Maintenance

TYCO Model FH-1 Flexible Hose must be maintained, inspected, and serviced in accordance with the instructions below in addition to any specific requirements of the applicable Authorities Having Jurisdiction (for example, NFPA). Any impairment must be immediately corrected. It is also recommended that fire protection systems be inspected by a qualified Inspection Service.

NOTICE

Before closing a fire protection system control valve for inspection or maintenance work on the fire protection system that it controls, obtain permission to shut down the effected fire protection system from the proper authorities and notify all personnel who may be affected by this action.

After placing a fire protection system in service, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.

Owners are 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. The installing contractor or product manufacturer should be contacted relative to any questions.

Automatic sprinkler systems are recommended to 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 Protection Products (TFPP) 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 TFPP. No warranty is given for products or components manufactured by companies not affiliated with ownership with TFPP 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 TFPP to be defective shall be either repaired or replaced, at TFPP's sole option. TFPP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFPP 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 TFPP 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 TFPP was informed about the possibility of such damages, and in no event shall TFPP'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.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product description and Part Number (P/N).

The Model FH-1 Flexible Hose Assembly includes the following items:

- Flexible Hose
- Inlet Nipple
- Straight Sprinkler Reducer
- Reducer Bracket
- Bar Fixing Clamps
- Support Bar

Flexible Hose

Specify Model FH-1 Flexible Hose Assembly, (200 psi/13,8 bar or 175 psi/12,1 bar) pressure, (1/2-inch or 3/4-inch NPT) connection, (assembly length), and P/N (below):

200 psi (13,8 bar), 1/2-Inch NPT

2.3' (700 mm) P/N TYFH-T-1-0700
3.3' (1000 mm) P/N TYFH-T-1-1000
3.9' (1200 mm) P/N TYFH-T-1-1200
4.9' (1500 mm) P/N TYFH-T-1-1500
5.9' (1800 mm) P/N TYFH-T-1-1800

200 psi (13,8 bar), 3/4-Inch NPT

2.3' (700 mm) P/N TYFH-T-3-0700
3.3' (1000 mm) P/N TYFH-T-3-1000
3.9' (1200 mm) P/N TYFH-T-3-1200
4.9' (1500 mm) P/N TYFH-T-3-1500
5.9' (1800 mm) P/N TYFH-T-3-1800

175 psi (12,1 bar), 1/2-Inch NPT

2.3' (700 mm) P/N TYFH-O-1-0700
3.3' (1000 mm) P/N TYFH-O-1-1000
3.9' (1200 mm) P/N TYFH-O-1-1200
4.9' (1500 mm) P/N TYFH-O-1-1500
5.9' (1800 mm) P/N TYFH-O-1-1800

175 psi (12,1 bar), 3/4-Inch NPT

2.3' (700 mm) P/N TYFH-O-3-0700
3.3' (1000 mm) P/N TYFH-O-3-1000
3.9' (1200 mm) P/N TYFH-O-3-1200
4.9' (1500 mm) P/N TYFH-O-3-1500
5.9' (1800 mm) P/N TYFH-O-3-1800

Inlet Nipple

Specify Inlet Nipple for Model FH-1 Flexible Hose with 25 mm hose thread, ISO 7/1-R1 inlet thread connection, and P/N (below):

ISO 7/1-R 1 P/N HOSENIP25

Straight Sprinkler Reducer

Specify Straight Sprinkler Reducer for Model FH-1 Flexible Hose for 25 mm hose threads with outlet thread connection (1/2 inch NPT or 3/4 inch NPT), and P/N (below):

1/2 inch NPT P/N RBR120
3/4 inch NPT P/N SBR120

Reducer Bracket

Specify Reducer Bracket for Model FH-1 Flexible Hose and P/N (below):

Reducer Bracket P/N TYFHRB0001

Bar Fixing Clamps

Specify Bar Fixing Clamps for Model FH-1 Flexible Hose and P/N (below):

Bar Fixing Clamp P/N RBF58T

Support Bar

Specify (length) Support Bar for Model FH-1 Flexible Hose and P/N (below):

2.3' (700 mm) P/N TYFHSB0700
3.3' (1000 mm) P/N TYFHSB1000
4.9' (1500 mm) P/N TYFHSB1500

