



Model FH-1 Flexible Hose Available in Asia and Pacific Territories Only

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.

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.

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.

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.

Technical Data

Approvals

UL Listed (See Table A)
FM Approved (See Table B)

Nominal Assembly Lengths

700 mm, 1000 mm, 1200 mm,
1500 mm, 1800 mm

Styles

Braided and Unbraided

Inlet Connection

ISO 7-R 1

Outlet Connections

1/2 in. NPT
3/4 in. NPT

Maximum Service Pressure

13,8 bar (See Table A)
12,1 bar (See Tables A and B)

Maximum Ambient Temperature

107°C

Discharge Coefficient

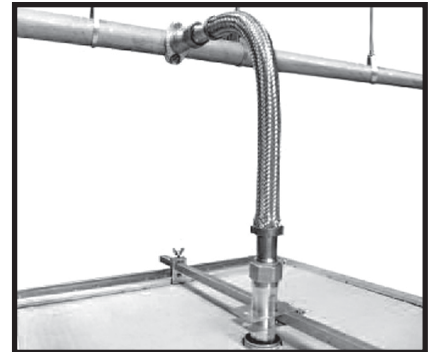
See Tables A and B

Minimum Installation Bend Radius

See Tables A and B

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.

Part Number	Hose Assembly Length mm	Outlet Connection NPT	Discharge Coefficient Maximum Allowable K-factor lpm/bar ^½	Maximum Number of 90° Bends	Minimum Bend Radius mm	Equivalent Length of Schedule 40 Steel Pipe C = 120 in Meters
Braided 13,8 bar 1/2 Inch NPT						
TYFH-T-1-0700	700	1/2	115,2	2	102	7,9
TYFH-T-1-1000	1000	1/2	115,2	3	102	13,7
TYFH-T-1-1200	1200	1/2	115,2	3	102	15,5
TYFH-T-1-1500	1500	1/2	115,2	3	102	20,1
TYFH-T-1-1800	1800	1/2	115,2	3	102	21,0
Braided 13,8 bar 3/4 Inch NPT						
TYFH-T-3-0700	700	3/4	201,6	2	102	9,4
TYFH-T-3-1000	1000	3/4	201,6	3	102	15,2
TYFH-T-3-1200	1200	3/4	201,6	3	102	16,8
TYFH-T-3-1500	1500	3/4	201,6	3	102	21,3
TYFH-T-3-1800	1800	3/4	201,6	3	102	22,6
Unbraided 12,1 bar 1/2 Inch NPT						
TYFH-O-1-0700	700	1/2	80,6	2	102	7,9
TYFH-O-1-1000	1000	1/2	80,6	3	102	13,7
TYFH-O-1-1200	1200	1/2	80,6	3	102	15,5
TYFH-O-1-1500	1500	1/2	80,6	3	102	20,1
TYFH-O-1-1800	1800	1/2	80,6	3	102	21,0
Unbraided 12,1 bar 3/4 Inch NPT						
TYFH-O-3-0700	700	3/4	115,2	2	102	9,4
TYFH-O-3-1000	1000	3/4	115,2	3	102	15,2
TYFH-O-3-1200	1200	3/4	115,2	3	102	16,8
TYFH-O-3-1500	1500	3/4	115,2	3	102	21,3
TYFH-O-3-1800	1800	3/4	115,2	3	102	22,6
Notes All Part Numbers have a Maximum Ambient Temperature of 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 150 mm for each model and associated pressure losses expressed in equivalent length of DN25 Schedule 40 Steel Pipe, in meters, where C equals 120.						
TABLE A MODEL FH-1 FLEXIBLE HOSE UL DESIGN CRITERIA						

Part Number	Hose Assembly Length mm	Outlet Connection NPT	Discharge Coefficient Maximum Allowable K-factor lpm/bar ^{1/2}	Maximum Number of 90° Bends	Minimum Bend Radius mm	Equivalent Length of Schedule 40 Steel Pipe C = 120 in Meters
Braided 12,1 bar 1/2 Inch NPT						
TYFH-T-1-0700	700	1/2	80,6	1	230	8,6
TYFH-T-1-1000	1000	1/2	80,6	2	230	13,9
TYFH-T-1-1200	1200	1/2	80,6	2	230	17,5
TYFH-T-1-1500	1500	1/2	80,6	3	230	21,2
TYFH-T-1-1800	1800	1/2	80,6	4	230	24,9
Braided 12,1 bar 3/4 Inch NPT						
TYFH-T-3-0700	700	3/4	115,2	1	230	8,4
TYFH-T-3-1000	1000	3/4	115,2	2	230	12,4
TYFH-T-3-1200	1200	3/4	115,2	2	230	15,1
TYFH-T-3-1500	1500	3/4	115,2	3	230	19,1
TYFH-T-3-1800	1800	3/4	115,2	4	230	23,1
NOTES <ul style="list-style-type: none"> All Part Numbers have a Maximum Ambient Temperature of 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 300 mm for each model and associated pressure losses expressed in equivalent length of DN25 Schedule 40 Steel Pipe, in meters, where C equals 120. 						
<p align="center">TABLE B MODEL FH-1 FLEXIBLE HOSE FM DESIGN CRITERIA</p>						

Design Criteria

Criteria in this section 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 NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) standards NFPA 13, 13D, and 13R.

Approved components (Sprinkler Reducer, Reducer Bracket and 58 mm Bar Fixing Clamps) included with FH-1 assemblies will accommodate exposed or semi-recessed sprinkler installations only. (See Figure 3.)

NOTE: Separately ordered 95 mm Bar Fixing Clamps may be used for installations in areas where structures or equipment extending immediately above the ceiling pose an interference

to proper placement of the Support Bar and Sprinkler Reducer. 95 mm clamps provide for greater clearance than standard 58 mm clamps included with FH-1 assemblies. For instance, concealed sprinklers, which typically require a distance from the face of the Sprinkler Reducer to the mounting surface greater than that for non-concealed sprinklers, necessitate installation with 95 mm clamps. See Figure 3 and Ordering Procedure.

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

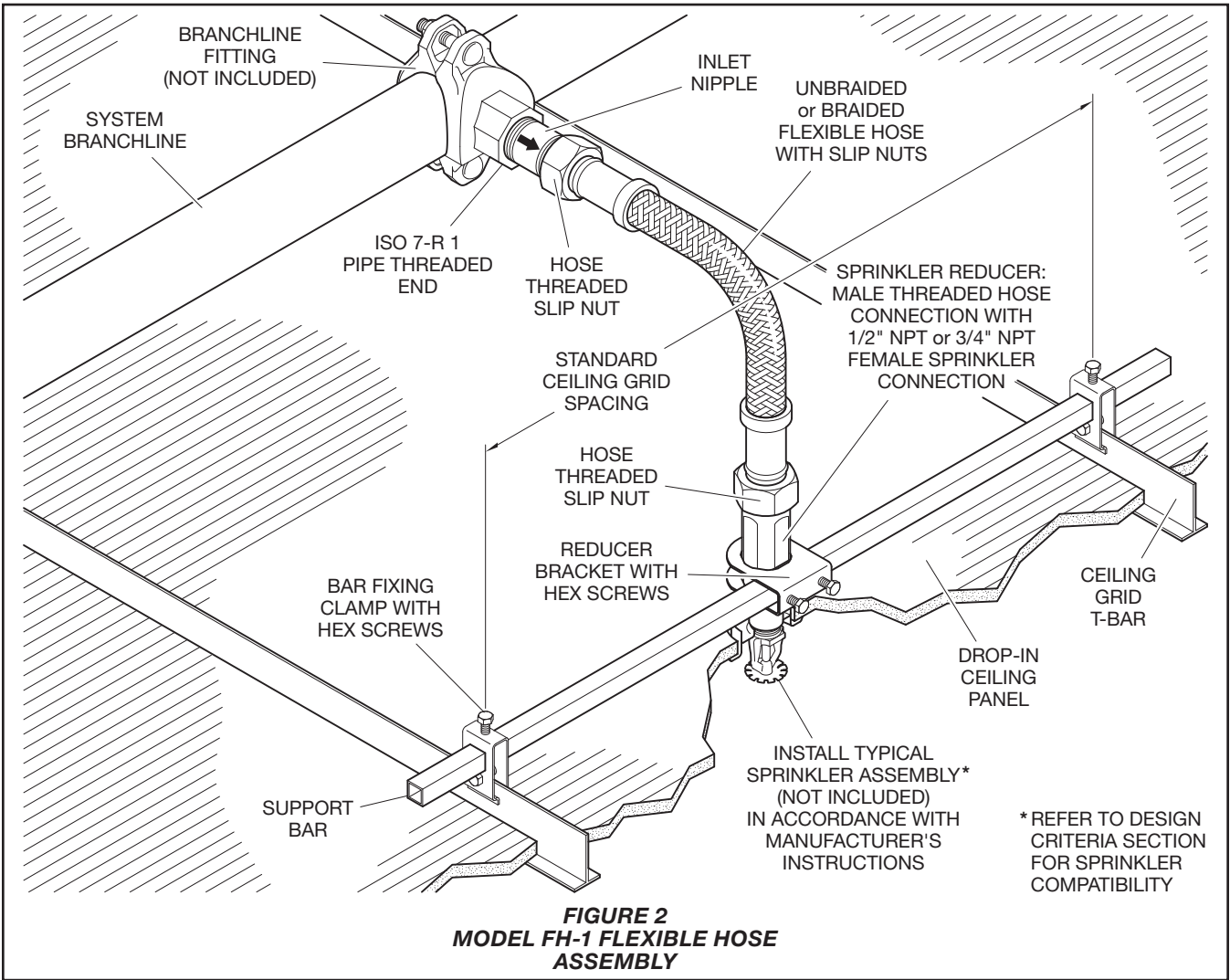
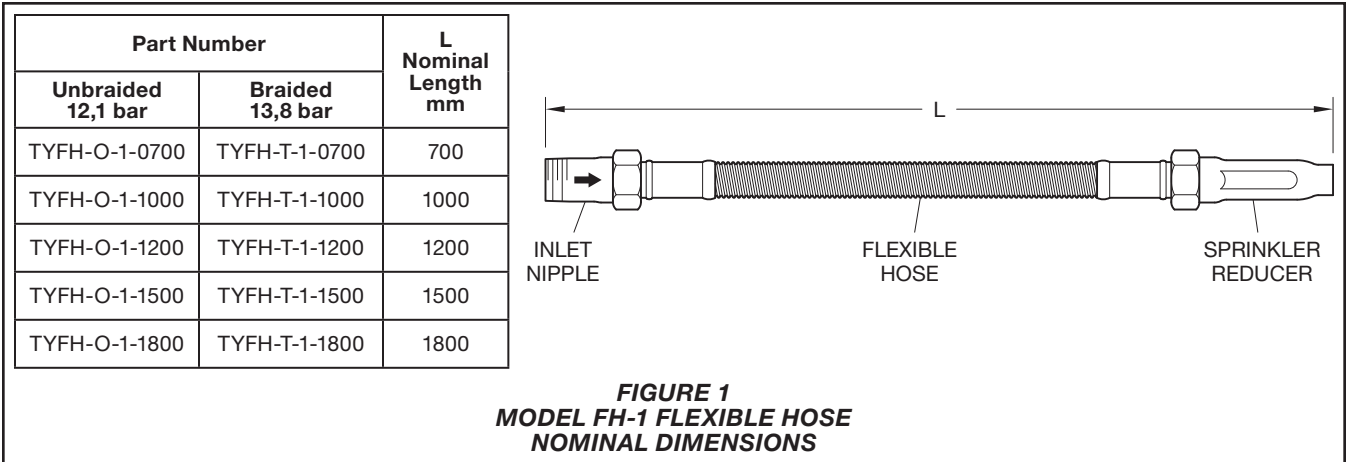
These connections are based on INTERNATIONAL BUILDING CODE (IBC) standards, and are designed for use in ceilings with grids that meet the following standards:

- ASTM C635 (Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings)

- ASTM C636 (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.

Refer to relative regulations, codes, or standards for guidance and determination of desirable location for unit in use; e.g., commercial ceilings, clean rooms, and duct systems.



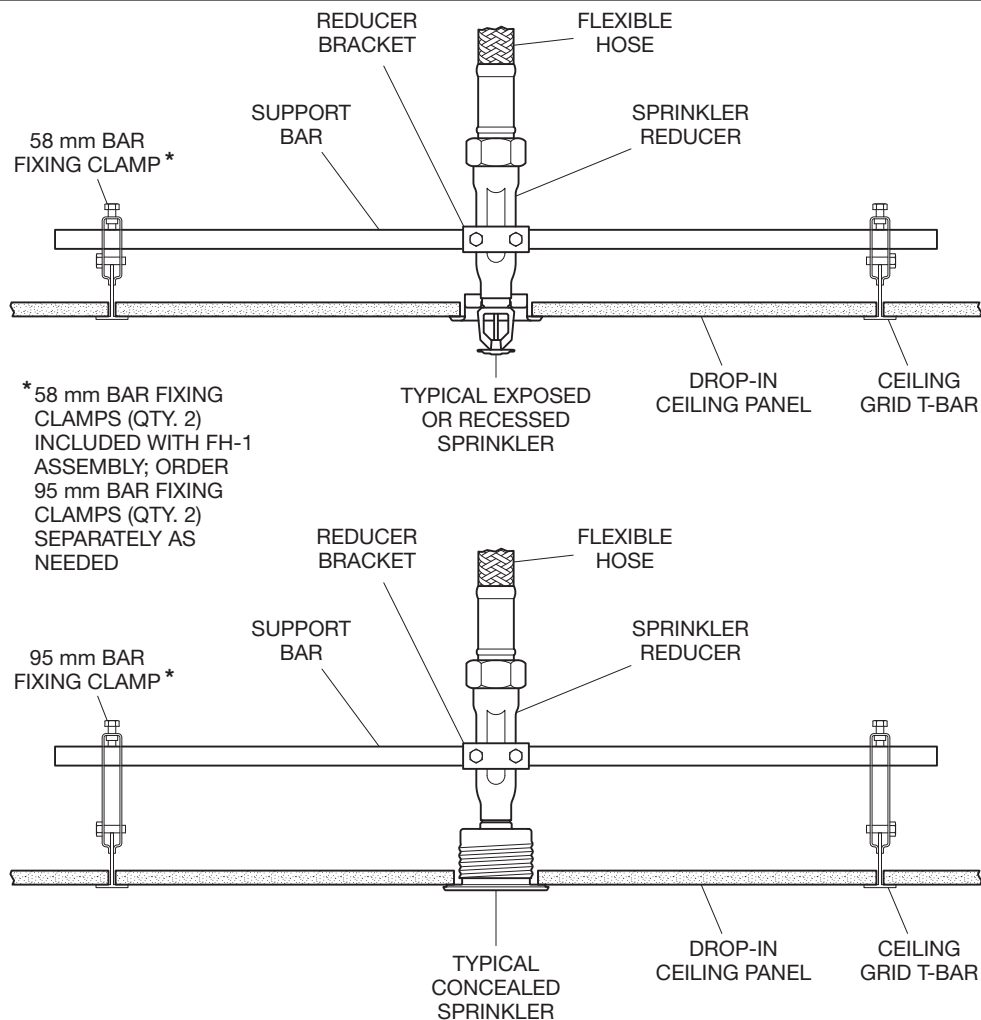
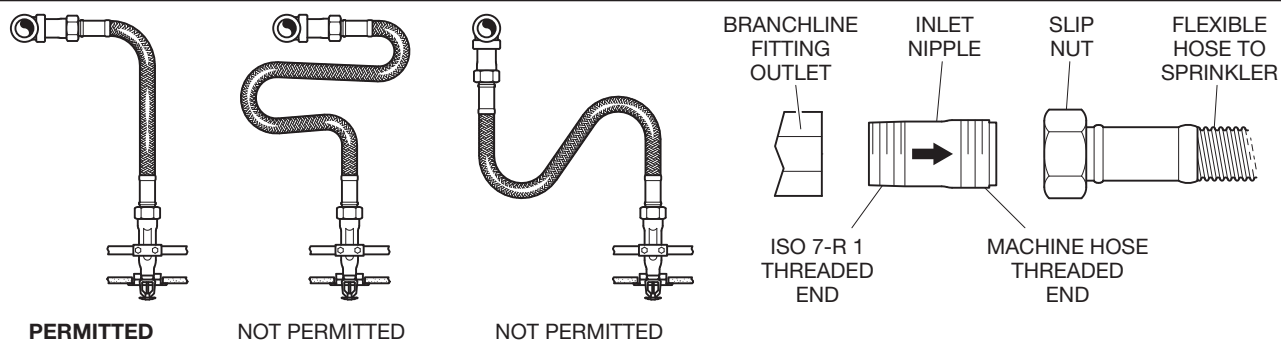


FIGURE 3
MODEL FH-1 FLEXIBLE HOSE
BAR FIXING CLAMP APPLICATION



DO route the Flexible Hose to permit entire draining either back into the branchline or through the Sprinkler Reducer.

DO use the Inlet Nipple with the direction of the flow arrow properly oriented to avoid mismatched threads.

FIGURE 4
MODEL FH-1 FLEXIBLE HOSE
INSTALLATION GUIDANCE

Installation

With reference to Figures 2, 3 and 4, TYCO Model FH-1 Flexible Sprinkler Hose must be installed in accordance with this section.

NOTICE

Flexible Hoses are intended only to connect sprinklers directly to system piping; for an example, see Figure 2. 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.

Step 1. Ensure Inlet Nipple is separated from Flexible Hose.

Step 2. Apply pipe-thread sealant to ISO 7-R 1 tapered pipe thread end of Inlet Nipple.

NOTE: Do not apply thread sealant to straight machine thread end of Inlet Nipple.

Step 3. Install ISO 7-R 1 thread end of Inlet Nipple into ISO 7-Rc 1 thread outlet of branchline fitting.

NOTE: Arrow on Inlet Nipple indicates appropriate direction of flow to sprinkler.

NOTE: Do not apply pipe wrench on pipe threads and straight threads of Inlet Nipple.

Step 4. Retract Flexible Hose Slip Nut and ensure O-Ring is fully seated against Flexible Hose fitting collar.

Step 5. Insert Flexible Hose fitting into Inlet Nipple and hand tighten Slip Nut onto Inlet Nipple.

Step 6. Apply adjustable wrench to Flexible Hose Slip Nut and tighten onto Inlet Nipple to a torque of 12,1 Nm.

NOTE: Higher levels of torque can distort Inlet Nipple and Slip Nut and damage O-Ring inside Flexible Hose Assembly fitting with consequent leakage or impairment of the assembly.

NOTE: Do not twist Flexible Hose to tighten Slip Nut onto Inlet Nipple.

Step 7. Determine approximate location of sprinkler, which should be as close as possible to center of distance between Ceiling Grid T-Bars, and select appropriate Support Bar length to accommodate T-Bar spacing.

Step 8. Slide Reducer Bracket and two Bar Fixing Clamps onto Support Bar, loosely tightening screws.

Step 9. Attach Bar Fixing Clamps to tops of Ceiling Grid T-Bars, loosening screws as necessary to adjust clamp positions. With Support Bar positioned across sprinkler location tighten screws loosely to a torque of 2,8 Nm.

Step 10. Retract Slip Nut at outlet end of Flexible Hose and ensure O-Ring is fully seated against Flexible Hose fitting collar.

Step 11. Insert Flexible Hose fitting into Sprinkler Reducer and hand tighten Slip Nut onto Sprinkler Reducer.

Step 12. Apply adjustable wrench to Flexible Hose Slip Nut and tighten onto Sprinkler Reducer to a torque of 12,1 Nm.

NOTE: Higher levels of torque can distort Sprinkler Reducer and Slip Nut and damage O-Ring inside Flexible Hose Assembly fitting with consequent leakage or impairment of the assembly.

Step 13. Bend Flexible Hose into a curve(s) that locates Sprinkler Reducer in area where the sprinkler will be located. Do not twist hose and ensure that bend arc is large and smooth. Adhere to minimum bend radius in accordance with Table A or B as applicable.

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.

Step 14. Verify that Sprinkler Reducer is correctly located before securing Reducer Bracket. Adjust Sprinkler Reducer by moving it vertically and horizontally along Support Bar. Tighten all bolts securely and evenly by applying a torque of 5,6 Nm.

Step 15. Attach Sprinkler to Sprinkler Reducer. Place a wrench on the Sprinkler Reducer to counteract tightening torque and to prevent Flexible Hose from twisting. Refer to sprinkler manufacturer's data sheets for appropriate sprinkler tightening torque, sprinkler wrench, and other installation guidance.

Step 16. Verify that Sprinkler Reducer is seated in Reducer Bracket. Precisely locate the sprinkler in all three axes in accordance with sprinkler manufacturer's data sheet. Tighten Bar Fixing Clamps and the Reducer Bracket Screws to a torque of 5,6 Nm.

Step 17. After tightening all screws, verify sprinkler is properly located in accordance with manufacturer's instructions. If not, loosen Bar Fixing Clamp or Reducer Bracket Screws and re-adjust as required. Re-tighten screws as previously described.

Care and Maintenance

TYCO Model FH-1 Flexible Hose must be maintained, inspected, and serviced in accordance with this section in addition to any specific requirements of the applicable authorities having jurisdiction (e.g., NFPA). Any impairment must be immediately corrected. It is also recommended that fire protection systems be inspected by a qualified Inspection Service.

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.

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 product manufacturer with 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.

Ordering Procedure

This product is available for sale in the Asia and Pacific markets only.

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 (58 mm, Qty. 2)^a
- Support Bar (1000 mm)^b
 - a. If required, order 95 mm Bar Fixing Clamps separately.
 - b. If required, order 700 mm or 1500 mm Support Bars separately.

Flexible Hose Assembly

Specify: Model FH-1 Flexible Hose Assembly, (specify) 13,8 bar or 12,1 bar pressure, (specify) assembly length, (specify) 1/2 in. NPT or 3/4 in. NPT connection, and P/N (specify per Table A or B)

REPLACEMENT PARTS

Inlet Nipple

Specify: Inlet Nipple for Model FH-1 Flexible Hose with 25 mm hose thread, ISO 7-R 1 inlet thread connection, P/N TYFHHOSENIP25

Straight Sprinkler Reducer

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

1/2 in. NPT TYFHRBR120
 3/4 in. NPT TYFHsBR120

Reducer Bracket

Specify: Reducer Bracket for Model FH-1 Flexible Hose, P/N TYFHRB0001

Bar Fixing Clamps

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

58 mm TYFHRBF58T
 95 mm TYFHRBF95T

Support Bar

Select Support Bar length to accommodate ceiling grid spacing.

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

700 mm TYFHsB0700
 1000 mm TYFHsB1000
 1500 mm TYFHsB1500

