RELIABLE
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FIRE SPRINKLER
MATERIAL SUBMITTAL
For
ERWIN ELEMENTARY
At
ERWIN, NORTH CAROLINA

Series TY-FRB – 2.8, 4.2, 5.6, and 8.0 K-Factor Upright, Pendent, and Recessed Pendent Sprinklers Quick Response, Standard Coverage

General Description

The TYCO Series TY-FRB 2.8, 4.2, 5.6, and 8.0 K-factor Upright, Pendent, and Recessed Pendent Sprinklers described in herein are quick response, standard coverage, decorative 3 mm glass bulb-type spray sprinklers. They are designed for use in light or ordinary hazard, commercial occupancies such as banks, hotels, and shopping malls.

The TY-FRB Recessed Pendent Sprinkler, where applicable, is intended for use in areas with a finished ceiling. This recessed pendent sprinkler uses one of the following Recessed Escutcheons:

- A two-piece Style 10 (1/2 in. NPT) or Style 40 (3/4 in. NPT) Recessed Escutcheon with 1/2 in. (12,7 mm) of recessed adjustment or up to 3/4 in. (19,1 mm) of total adjustment from the flush pendent position.
- A two-piece Style 20 (1/2 in. NPT) or Style 30 (3/4 in. NPT) Recessed Escutcheon with 1/4 in. (6,4 mm) of recessed adjustment or up to 1/2 in. (12,7 mm) of total adjustment from the flush pendent position.

The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe drops to the sprinklers must be cut.

Corrosion-resistant coatings, where applicable, are utilized to extend the life of copper alloy sprinklers beyond what would be obtained when exposed to corrosive atmospheres. Although corrosion-resistant coated sprinklers have passed the standard corrosion tests of the applicable approval agencies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity, should be considered, as a minimum, along with the corrosive nature of the chemical to which the sprinklers will be exposed.

An intermediate level version of the Series TY-FRB Pendent Sprinklers is detailed in Technical Data Sheet TFP356. Sprinkler Guards are detailed in Technical Data Sheet TFP780.

IMPORTANT

Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

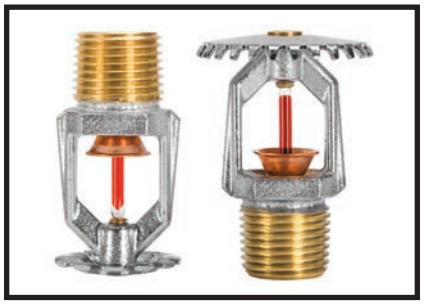
Always refer to Technical Data Sheet TFP700 for the "INSTALLER WARNING" that provides cautions with respect to handling and installation of sprinkler systems and components. Improper handling and installation can permanently damage a sprinkler system or its components and cause the sprinkler to fail to operate in a fire situation or cause it to operate prematurely.

NOTICE

The Series TY-FRB 2.8, 4.2, 5.6, and 8.0 K-factor Upright, Pendent, and Recessed Pendent Sprinklers described herein must be installed and maintained in compliance with this document and with the applicable standards of the National Fire Protection Association (NFPA), in addition to the standards of any 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. The installing contractor or sprinkler manufacturer should be contacted with any questions.

NFPA 13 prohibits installation of 1/2 in. NPT sprinklers with K-factors greater than 5.6 in new construction. They are intended for retrofit in existing sprinkler systems only.



Sprinkler Identification Number (SIN)

TY1131 . . . Upright 2.8K, 1/2 in. NPT
TY1231 . . Pendent 2.8K, 1/2 in. NPT
TY2131 . . . Upright 4.2K, 1/2 in. NPT
TY2231 . . Pendent 4.2K, 1/2 in. NPT
TY3131 . . . Upright 5.6K, 1/2 in. NPT
TY3231 . . Pendent 5.6K, 1/2 in. NPT
TY4131 . . . Upright 8.0K, 3/4 in. NPT
TY4231 . . Pendent 8.0K, 3/4 in. NPT
TY4831 . . . Upright 8.0K, 1/2 in. NPT
TY4931 . . Pendent 8.0K, 1/2 in. NPT

Technical Data

Approvals
UL and C-UL Listed
FM, LPCB, and NYC Approved

Refer to Table A and B for complete approval information including corrosion-resistant status.

Maximum Working Pressure
Refer to Table C

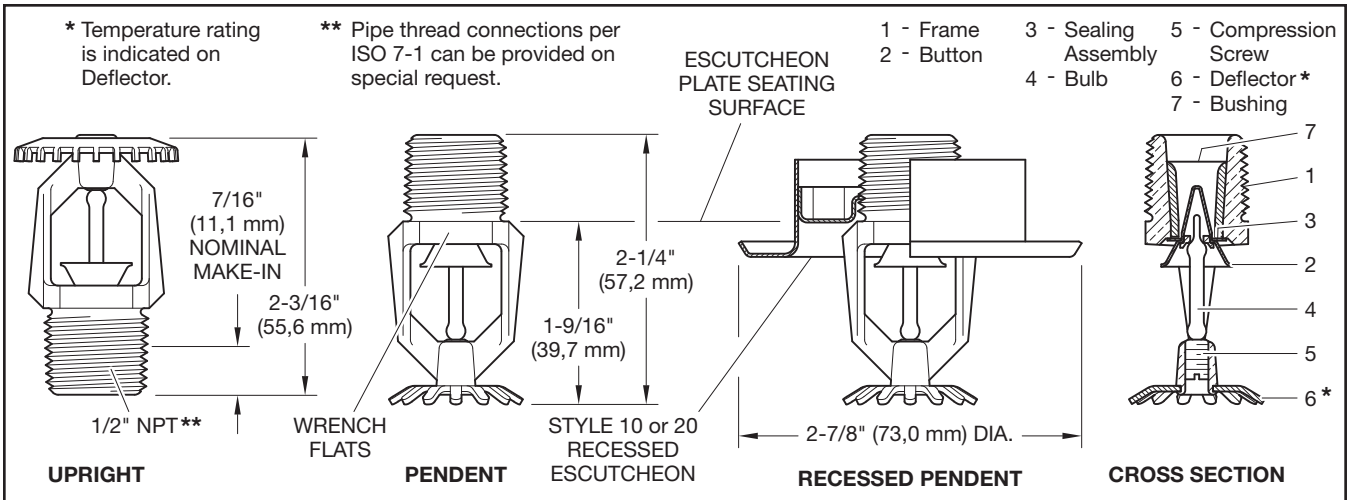


FIGURE 1
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY1131) AND PENDENT (TY1231) SPRINKLERS
2.8 K-FACTOR, 1/2 IN. NPT

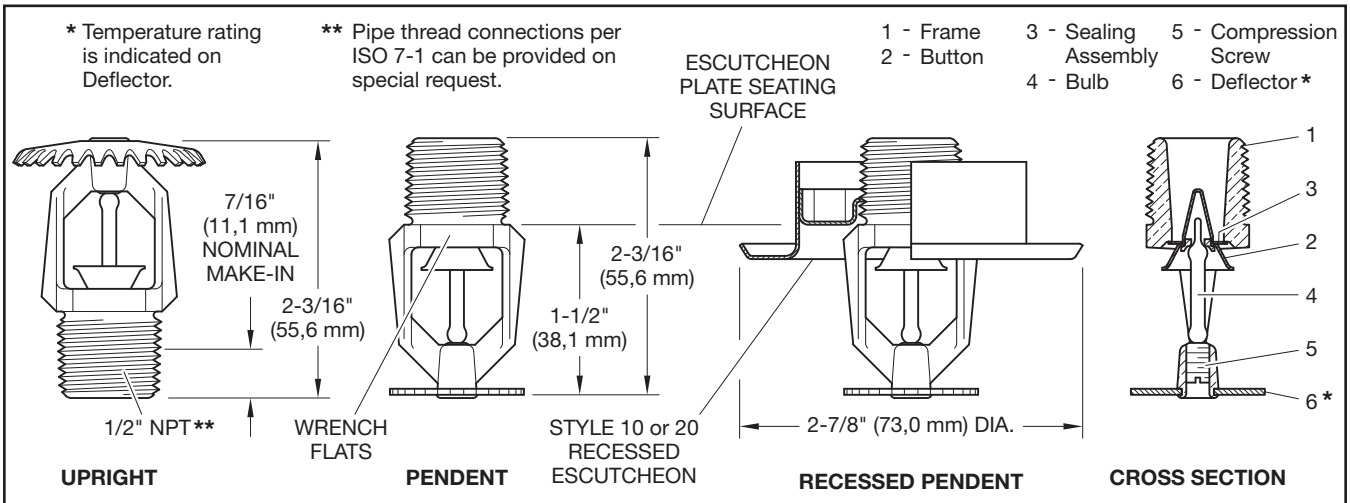


FIGURE 2
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY2131) AND PENDENT (TY2231) SPRINKLERS
4.2 K-FACTOR, 1/2 IN. NPT

Discharge Coefficient
K=2.8 GPM/psi½ (40,3 LPM/bar½)
K=4.2 GPM/psi½ (60,5 LPM/bar½)
K=5.6 GPM/psi½ (80,6 LPM/bar½)
K=8.0 GPM/psi½ (115,2 LPM/bar½)

Temperature Rating
Refer to Table A and B

Finishes
Sprinkler: Refer to Table D

Recessed Escutcheon: Signal or Pure White, Grey Aluminum, Jet Black, Chrome Plated, or Natural Brass

Physical Characteristics
Frame . . . . . Bronze
Button . . . . . Brass/Copper
Sealing Assembly . . Beryllium Nickel w/TEFLON
Bulb . . . . . Glass
Compression Screw . . . . . Bronze
Deflector . . . . . Copper/Bronze
Bushing (K=2.8) . . . . . Bronze

Poly-Stainless
Physical Characteristics
Frame . . . . . Bronze
Button . . . . . L316 Stainless Steel*
Bulb . . . . . Glass
Compression Screw . . . . . L316 Stainless Steel*
Deflector . . . . . Copper/Bronze
Sealing Assembly . Gold Plated Beryllium Nickel w/TEFLON

*Type L316 stainless steel (UNS 31603) per ASTM A479/479M or BS EN 1008 WN1.4404.

Operation

The glass bulb contains a fluid that 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.

Design Criteria

The TYCO Series TY-FRB 2.8, 4.2, 5.6, and 8.0 K-factor Upright, Pendent, and Recessed Pendent Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency, such as UL Listing based on the requirements of NFPA 13 and FM Approval based on the requirements of the FM Global Loss Prevention Data Sheets. Use only the style 10, 20, 30, or 40 Recessed Escutcheon, as applicable, for recessed pendent installations.

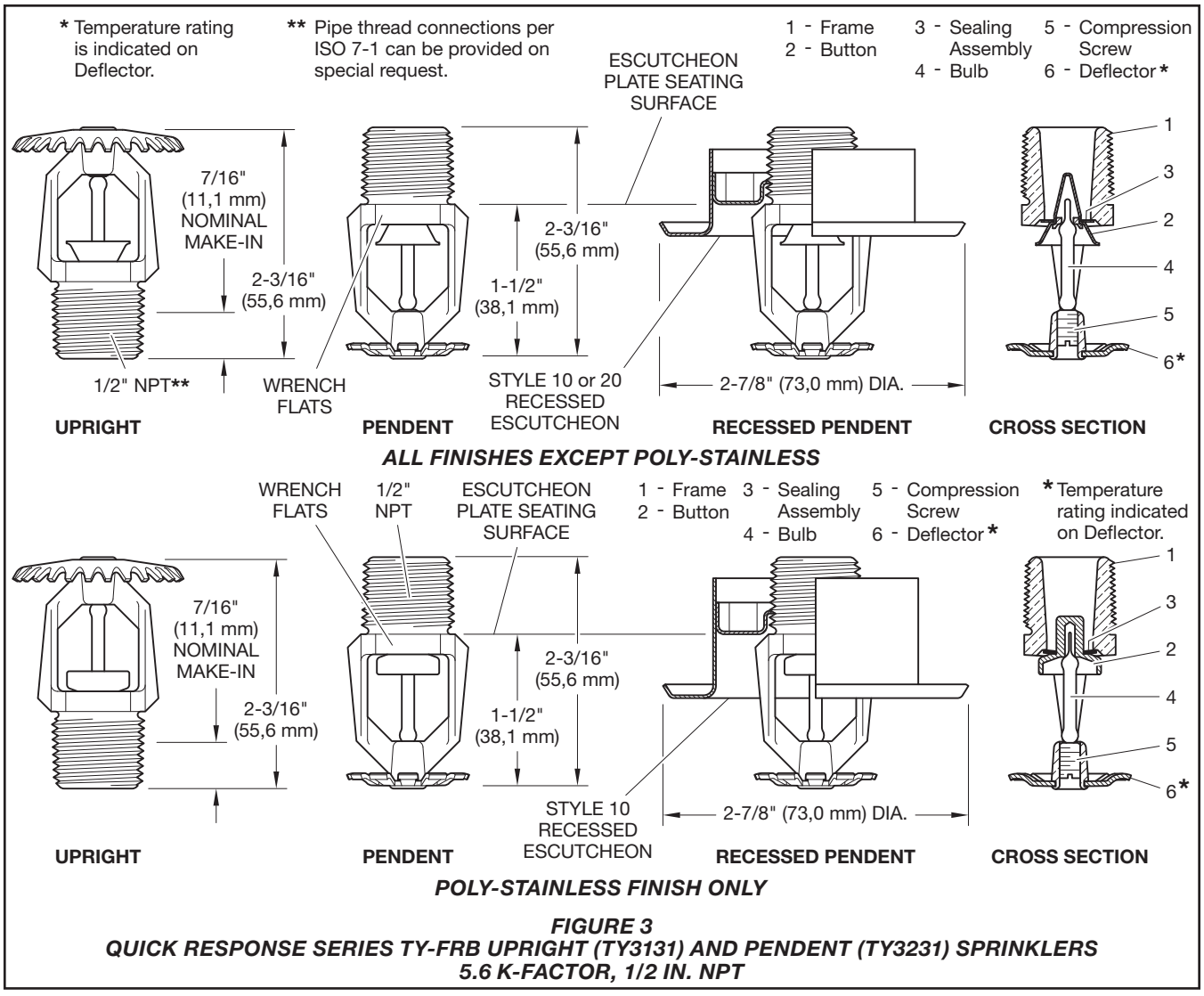


FIGURE 3
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY3131) AND PENDENT (TY3231) SPRINKLERS
5.6 K-FACTOR, 1/2 IN. NPT

Installation

The TYCO Series TY-FRB 2.8, 4.2, 5.6, and 8.0 K-factor Upright, Pendent, and Recessed Pendent 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 1/16 in. (1,6 mm) for the 135°F (57°C) and 3/32 in. (2,4 mm) for the 286°F (141°C) temperature ratings. A leak-tight 1/2 in. NPT sprinkler joint should be obtained by applying a minimum-to-maximum torque of 7 to 14 lb-ft (9,5 to 19,0 N·m). A leak tight 3/4 in. NPT sprinkler joint should be obtained with a torque of 10 to 20 lb-ft (13,4 to 26,8 N·m). Higher levels of torque can distort the sprinkler inlet and cause leakage or impairment of the sprinkler. Do not attempt to compensate for insufficient adjustment in the escutcheon plate by under- or over-tightening the sprinkler. Re-adjust the position of the sprinkler fitting to suit.

Series TY-FRB Upright and Pendent Sprinklers
The Series TY-FRB Upright and Pendent Sprinklers must be installed in accordance with the following instructions:

Step 1. Install pendent sprinklers in the pendent position. Install upright sprinklers 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 14). With reference to Figure 1 to Figure 5, apply the W-Type 6 Sprinkler Wrench to the sprinkler wrench flats.

Series TY-FRB Recessed Pendent Sprinklers
The Series TY-FRB Recessed Pendent Sprinklers must be installed in accordance with the following instructions:

Step 1. After installing the Style 10, 20, 30, or 40 Mounting Plate, as applicable, over the sprinkler threads and 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 7 Recessed Sprinkler Wrench (Ref. Figure 15). With reference to Figure 1 to 4, apply the W-Type 7 Recessed Sprinkler Wrench to the sprinkler wrench flats.

Step 3. After the ceiling is installed or the finish coat is applied, slide on the Style 10, 20, 30, or 40 Closure over the Series TY-FRB Recessed Pendent Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the ceiling.

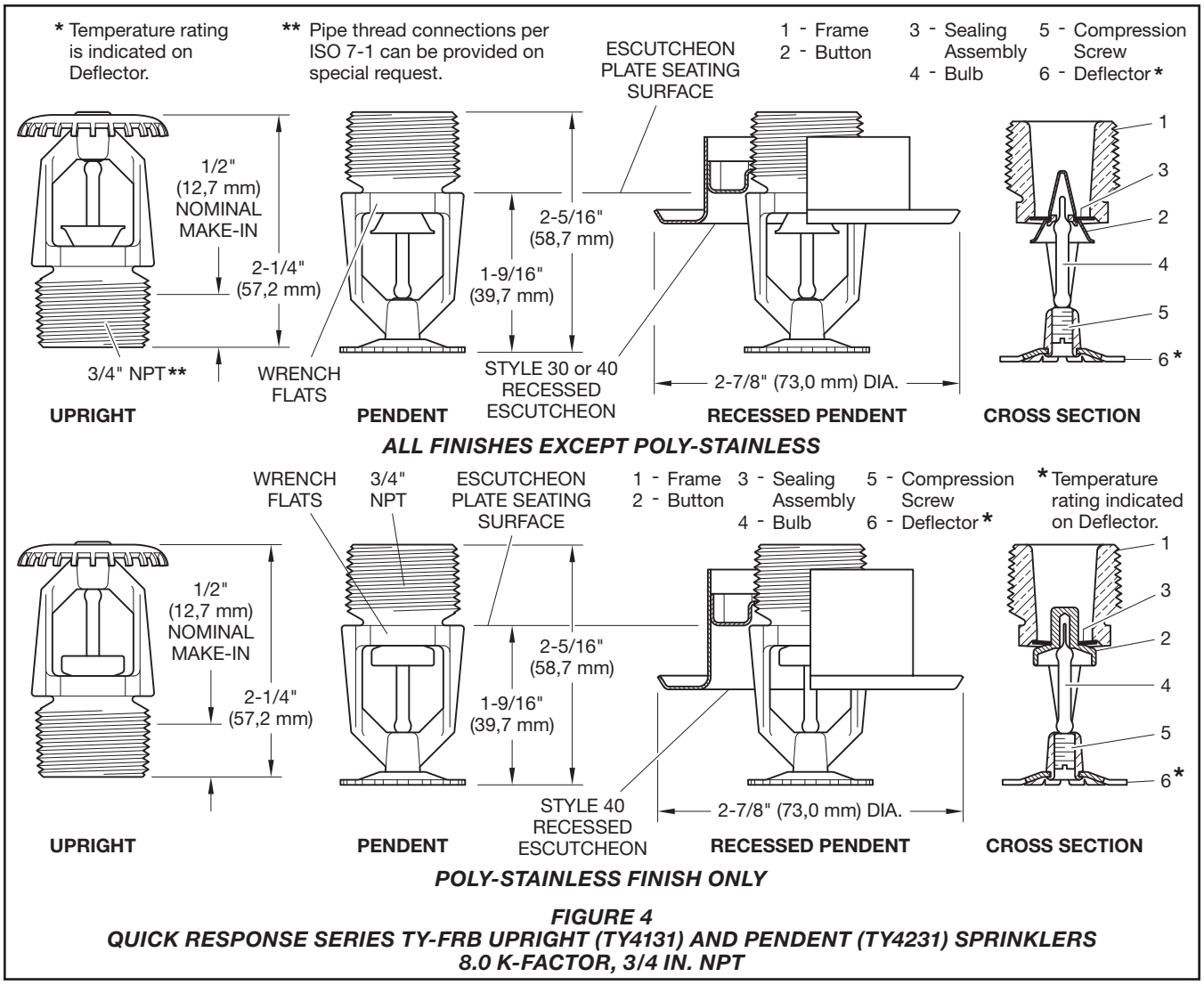


FIGURE 4
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY4131) AND PENDENT (TY4231) SPRINKLERS
8.0 K-FACTOR, 3/4 IN. NPT

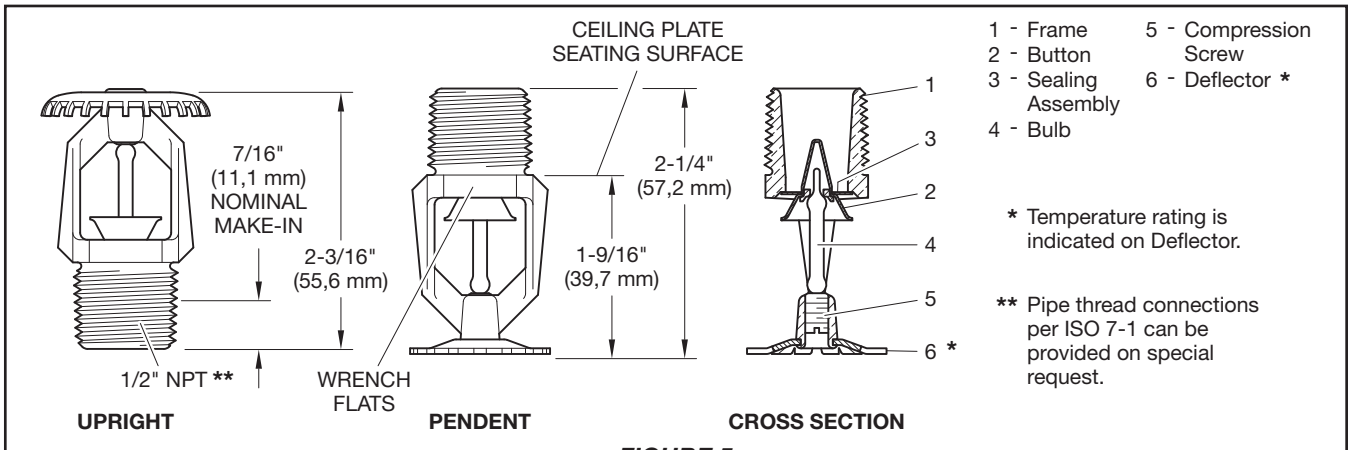


FIGURE 5
QUICK RESPONSE SERIES TY-FRB UPRIGHT (TY4831) AND PENDENT (TY4931) SPRINKLERS
8.0 K-FACTOR, 1/2 IN. NPT

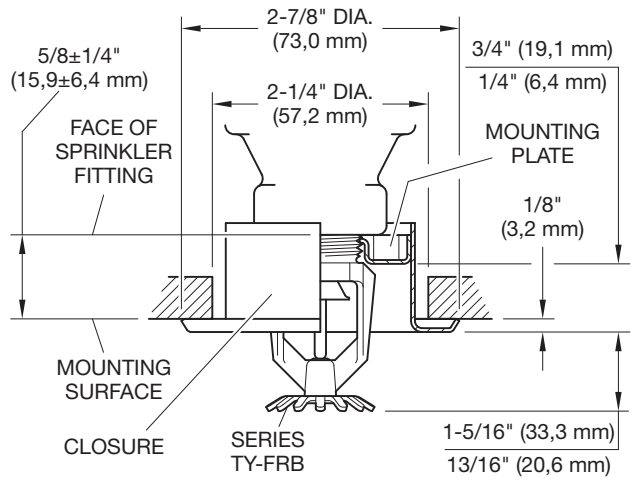


FIGURE 6
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 10 RECESSED ESCUTCHEON
2.8 K-FACTOR, 1/2 IN. NPT

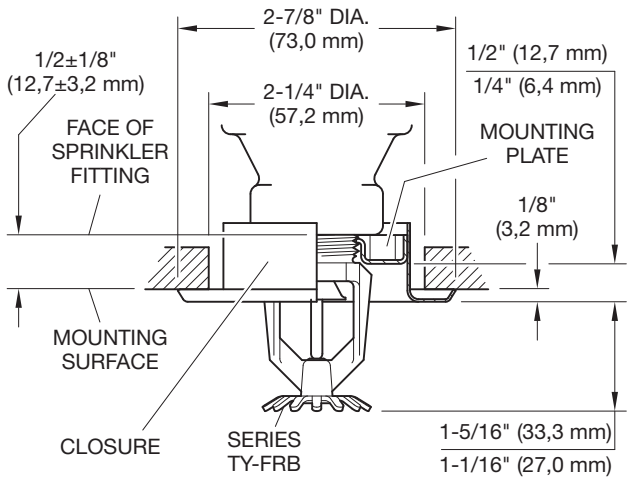


FIGURE 7
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 20 RECESSED ESCUTCHEON
2.8 K-FACTOR, 1/2 IN. NPT

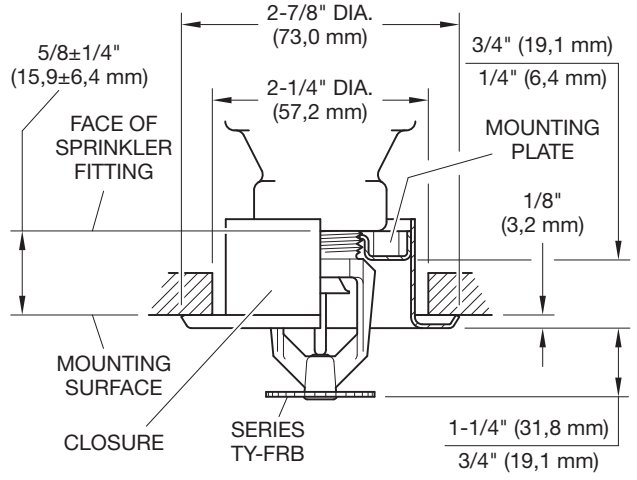


FIGURE 8
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 10 RECESSED ESCUTCHEON
4.2 K-FACTOR, 1/2 IN. NPT

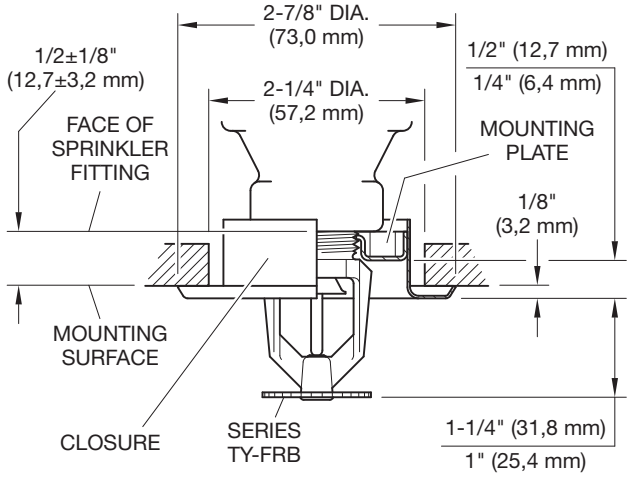


FIGURE 9
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 20 RECESSED ESCUTCHEON
4.2 K-FACTOR, 1/2 IN. NPT

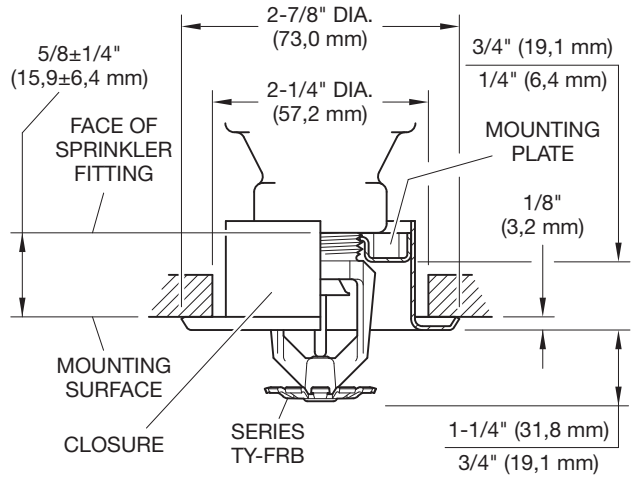


FIGURE 10
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 10 RECESSED ESCUTCHEON
5.6 K-FACTOR, 1/2 IN. NPT

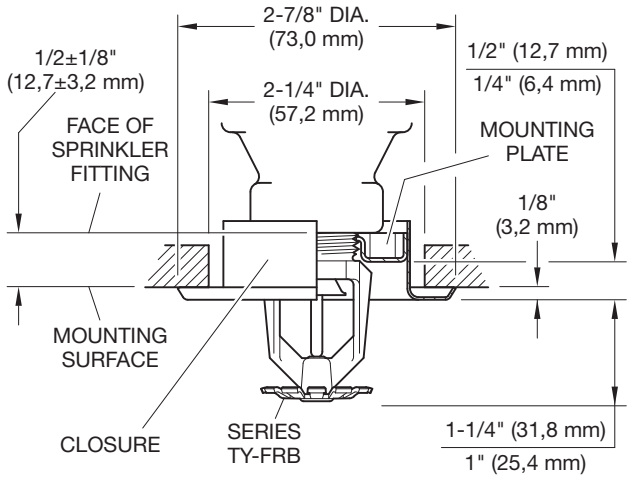


FIGURE 11
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 20 RECESSED ESCUTCHEON
5.6 K-FACTOR, 1/2 IN. NPT

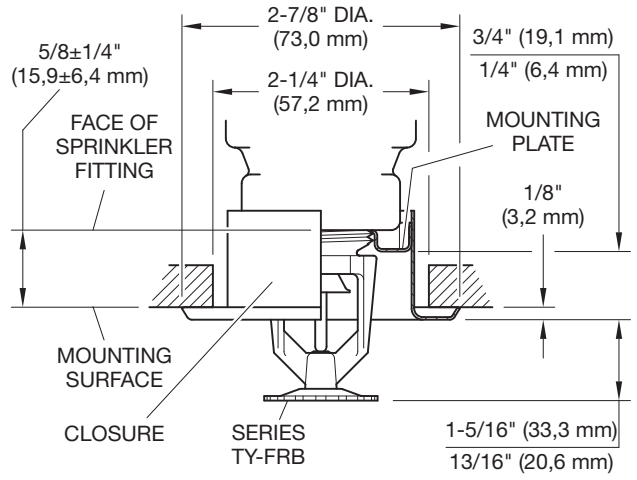


FIGURE 12
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT
STYLE 40 RECESSED ESCUTCHEON
8.0 K-FACTOR, 3/4 IN. NPT

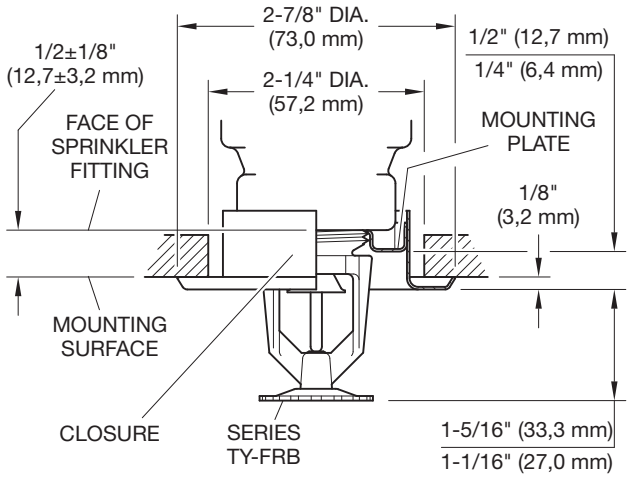


FIGURE 13
SERIES TY-FRB RECESSED PENDENT
WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT
STYLE 30 RECESSED ESCUTCHEON
8.0 K-FACTOR, 3/4 IN. NPT

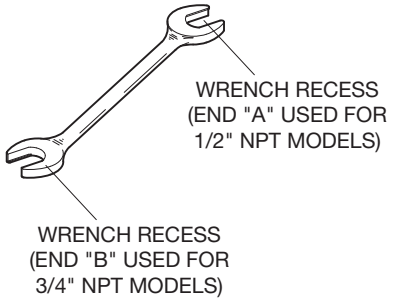


FIGURE 14
W-TYPE 6 SPRINKLER
WRENCH

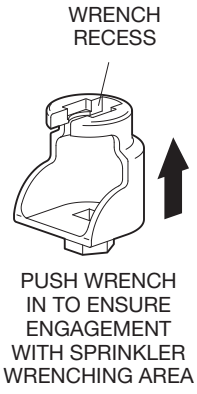


FIGURE 15
W-TYPE 7 RECESSED
SPRINKLER WRENCH

K-Factor	Type	Temperature	Sprinkler Finish[5]			
			Bulb Liquid Color	Natural Brass	Chrome Plated	Polyester[c]
2.8 1/2 in. NPT	Pendent (TY1231) and Upright (TY1131)	135°F (57°C)	Orange	1, 2, 3, 4		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
		286°F (141°C)	Blue			
	Recessed Pendent (TY1231)[a] Figure 6	135°F (57°C)	Orange	1, 2, 4		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
	Recessed Pendent (TY1231)[b] Figure 7	135°F (57°C)	Orange			
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
4.2 1/2 in. NPT	Pendent (TY2231) and Upright (TY2131)	135°F (57°C)	Orange	1, 2		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
		286°F (141°C)	Blue			
	Recessed Pendent (TY2231)[a] Figure 8	135°F (57°C)	Orange			
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
	Recessed Pendent (TY2231)[b] Figure 9	135°F (57°C)	Orange			
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			

NOTES
a. Installed with Style 10 (1/2 in. NPT) or Style 40 (3/4 in. NPT) 3/4 in. Total Adjustment Recessed Escutcheon, as applicable.
b. Installed with Style 20 (1/2 in. NPT) or Style 30 (3/4 in. NPT) 1/2 in. Total Adjustment Recessed Escutcheon, as applicable.
c. Frame and Deflector only.
1. Listed by Underwriters Laboratories, Inc., (UL) as Quick Response Sprinklers.
2. Listed by Underwriters Laboratories, Inc., for use in Canada (C-UL) as Quick Response Sprinklers.
3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.
4. Approved by the City of New York under MEA 354-01-E.
5. Where Polyester Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed, the sprinklers are UL and C-UL Listed as corrosion-resistant sprinklers.

TABLE A
LABORATORY LISTINGS AND APPROVALS FOR
2.8 AND 4.2 K-FACTOR SPRINKLERS

			Sprinkler Finish[8]						
K-Factor	**Type**	**Temperature**	**Bulb Liquid Color**	**Natural Brass**	**Chrome Plated**	**Polyester[c]**	**Poly-Stainless[c]**	**Lead Coated**
5.6 1/2 in. NPT	**Pendent (TY3231) and Upright (TY3131)**	135°F (57°C)	Orange	1, 2, 3, 4, 5, 6, 7			1, 2	1, 2, 3, 5
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
		286°F (141°C)	Blue					
	Recessed Pendent (TY3231)[a] Figure 10	135°F (57°C)	Orange	1, 2, 4, 5			1, 2	N/A[d]
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
		286°F (141°C)	Blue					
	Recessed Pendent (TY3231)[b] Figure 11	135°F (57°C)	Orange	1, 2, 3, 4, 5			N/A	N/A
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
		286°F (141°C)	Blue					
8.0 3/4 in. NPT	**Pendent (TY4231) and Upright (TY4131)**	135°F (57°C)	Orange	1, 2, 3, 4, 5, 6, 7			1, 2	1, 2, 5
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
		286°F (141°C)	Blue					
	Recessed Pendent (TY4231)[a] Figure 12	135°F (57°C)	Orange	1, 2, 5			1, 2	N/A
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
		286°F (141°C)	Blue					
	Recessed Pendent (TY4231)[b] Figure 13	135°F (57°C)	Orange	1, 2, 3, 5			N/A	N/A
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
		286°F (141°C)	Blue					
8.0 1/2 in. NPT	**Pendent (TY4931) and Upright (TY4831)**	135°F (57°C)	Orange	1, 2, 4, 5, 6			N/A	1, 2, 5
		155°F (68°C)	Red					
		175°F (79°C)	Yellow					
		200°F (93°C)	Green					
		286°F (141°C)	Blue					

NOTES
a. Installed with Style 10 (1/2 in. NPT) or Style 40 (3/4 in. NPT) 3/4 in. Total Adjustment Recessed Escutcheon, as applicable.
b. Installed with Style 20 (1/2 in. NPT) or Style 30 (3/4 in. NPT) 1/2 in. Total Adjustment Recessed Escutcheon, as applicable.
c. Frame and Deflector only.
d. Not Available (N/A)
1. Listed by Underwriters Laboratories, Inc., (UL) as Quick Response Sprinklers.
2. Listed by Underwriters Laboratories, Inc., for use in Canada (C-UL) as Quick Response Sprinklers.
3. Approved by Factory Mutual Research Corporation (FM) as Quick Response Sprinklers.
4. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 007k/04) as Quick Response Sprinklers. However, LPCB does not rate the thermal sensitivity of recessed sprinklers.
5. Approved by the City of New York under MEA 354-01-E.
6. VdS Approved (For details, contact Johnson Controls, Enschede, Netherlands, Tel. 31-53-428-4444/Fax 31-53-428-3377.)
7. Approved by the Loss Prevention Certification Board (LPCB Ref. No. 094a/06) as Quick Response Sprinklers.
8. Where Polyester Coated and Lead-Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed as Corrosion-Resistant Sprinklers. Where Lead-Coated Sprinklers are noted to be FM Approved, the sprinklers are FM Approved as a Corrosion-Resistant Sprinklers.

TABLE B
LABORATORY LISTINGS AND APPROVALS FOR
5.6 AND 8.0 K-FACTOR SPRINKLERS

K-Factor	Type	Sprinkler Finish			
		Natural Brass	Chrome Plated	Polyester	Lead Coated
2.8 1/2 in. NPT	Pendent (TY1231) and Upright (TY1131)	175 psi (12,1 bar)			N/A[2]
	Recessed Pendent (TY1231)				
4.2 1/2 in. NPT	Pendent (TY2231) and Upright (TY2131)	175 psi (12,1 bar)			N/A
	Recessed Pendent (TY2231)				
5.6 1/2 in. NPT	Pendent (TY3231) and Upright (TY3131)	250 psi (17,2 bar) or 175 psi (12,1 bar)[1]			
	Recessed Pendent (TY3231)				
8.0 3/4 in. NPT	Pendent (TY4231) and Upright (TY4131)	175 psi (12,1 bar)			175 psi (12,1 bar)
	Recessed Pendent(TY4231)				N/A
8.0 1/2 in. NPT	Pendent (TY4931) and Upright (TY4831)	175 psi (12,1 bar)			175 psi (12,1 bar)

NOTES
1. The maximum working pressure of 250 psi (17,2 bar) only applies to the Listing by Underwriters Laboratories Inc. (UL); the Listing by Underwriters Laboratories, Inc. for use in Canada (C-UL); and, the Approval by the City of New York.
2. Not applicable (N/A).

TABLE C
MAXIMUM WORKING PRESSURE

Care and Maintenance

The TYCO Series TY-FRB 2.8, 4.2, 5.6, and 8.0 K-factor Upright, Pendent, and Recessed Pendent 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, obtain permission to shut down the affected fire protection systems from the proper authorities and notify all personnel who may be affected by this action.

Absence of the outer piece of an escutcheon, which is used to cover a clearance hole, can delay sprinkler operation in a fire situation.

Sprinklers which 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 taken 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 National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or sprinkler manufacturer regarding 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.

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).

Initial and frequent visual inspections of random samples are recommended for corrosion-resistant sprinklers to verify the integrity of the corrosion-resistant material of construction. Thereafter, annual inspections per NFPA 25 should suffice.Inspections of corrosion-resistant sprinklers are recommended at close range, instead of from the floor level per NFPA. Inspection at close range can better determine the exact sprinkler condition and the long-term integrity of the corrosion-resistant material, which can be affected by the corrosive conditions present.

P/N 57 – XXX – X – XXX

		SIN
330	2.8K UPRIGHT (1/2 in. NPT)	TY1131
331	2.8K PENDENT (1/2 in. NPT)	TY1231
340	4.2K UPRIGHT (1/2 in. NPT)	TY2131
341	4.2K PENDENT (1/2 in. NPT)	TY2231
370	5.6K UPRIGHT (1/2 in. NPT)	TY3131
371	5.6K PENDENT (1/2 in. NPT)	TY3231
390	8.0K UPRIGHT (3/4 in. NPT)	TY4131
391	8.0K PENDENT (3/4 in. NPT)	TY4231
360	8.0K UPRIGHT (1/2 in. NPT)	TY4831
361	8.0K PENDENT (1/2 in. NPT)	TY4931

	SPRINKLER FINISH
1	NATURAL BRASS
2	POLY-STAINLESS GREY ALUMINUM (RAL9007)[1] POLYESTER
3	PURE WHITE POLYESTER (RAL9010)[2]
4	SIGNAL WHITE POLYESTER (RAL9003)
5	JET BLACK POLYESTER (RAL9005)[3]
7	LEAD COATED
9	CHROME PLATED

	TEMPERATURE RATINGS
135	135°F (57°C)
155	155°F (68°C)
175	175°F (79°C)
200	200°F (93°C)
286	286°F (141°C)

NOTES
1. Available only on TY3131, TY3231, TY4131, and TY4231
2. Eastern Hemisphere sales only.
3. Available in only 2.8K, 4.2K, and 8.0K, 155°F (68°C) and 200°F (93°C); requires longer lead time to manufacture.

TABLE D
SERIES TY-FRB PENDENT AND UPRIGHT SPRINKLERS
PART NUMBER SELECTION

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

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

Sprinkler Assemblies with NPT Thread Connections
Specify: Series TY-FRB (Specify SIN), (specify K-factor), (specify Pendent or Upright) Sprinkler (specify) temperature rating, (specify) finish or coating, P/N (specify from Table D)

Recessed Escutcheon
Specify: Style (10, 20, 30, or 40) Recessed Escutcheon with (specify*) finish, P/N (specify*)

* Refer to Technical Data Sheet TFP770

Sprinkler Wrench
Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001

1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700

Series RFII — 5.6 K-factor "Royal Flush II" Concealed Pendent Sprinklers Quick & Standard Response, Standard Coverage

General Description

The TYCO Series RFII 5.6 K-factor, "Royal Flush II" Concealed Pendent Sprinklers Quick Response (3-mm bulb) and Standard Response (5-mm bulb), are decorative sprinklers featuring a flat cover plate designed to conceal the sprinkler. These sprinklers are optimal for architecturally sensitive areas such as hotel lobbies, office buildings, churches, and restaurants.

Each sprinkler includes a Cover Plate/Retainer Assembly and a Sprinkler/Support Cup Assembly. The separable, two-piece assembly design provides the following benefits:

- Allows installation of the sprinklers and pressure testing of the fire protection system prior to installation of a suspended ceiling or application of the finish coating to a fixed ceiling.
- Permits the removal of suspended ceiling panels for access to building service equipment without having to first shut down the fire protection system and remove sprinklers.
- Provides for 1/2 in. (12,7 mm) of vertical adjustment to allow a measure of flexibility in determining the length of fixed piping to cut for the sprinkler drops.

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.

The Series RFII Sprinklers are shipped with a Disposable Protective Cap. The Protective Cap is temporarily removed during installation and replaced to help protect the sprinkler during ceiling installation or finish. The tip of the Protective Cap can be used to mark the center of the ceiling hole into plaster board or ceiling tiles by gently pushing the ceiling product against the Protective Cap. When ceiling installation is complete, the Protective Cap is removed and the Cover Plate/Retainer Assembly is installed.

As an option, the Series RFII Standard Response (5-mm bulb) "Royal Flush II" Concealed Pendent Sprinklers can be fitted with a silicone Air and Dust Seal. See Figure 5. The Air and Dust Seal is intended for sensitive areas where it is desirable to prevent air and dust from the area above the ceiling to pass through the cover plate.

NOTICE

The Series RFII Concealed Pendent Sprinklers described herein must be installed and maintained in compliance with this document and with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION (NFPA), in addition to the standards of any 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. The installing contractor or sprinkler manufacturer should be contacted with any questions.

Sprinkler Identification Number (SIN)

TY3531 — 3 mm bulb
TY3551 — 5 mm bulb

Technical Data

Sprinkler Approvals
Approvals apply only to the service conditions indicated in the Design Criteria section.

- TY3531 (3 mm Bulb) is UL Listed, C-UL Listed and NYC Approved (MEA 353-01-E) as Quick Response.
- TY3531 (3 mm Bulb) is VdS Approved (Certificate No. G4090007).
- TY3531 (3 mm Bulb) is FM and LPCB Approved (Ref. No. 094a/10) as Standard Response.

  Note: *FM and LPCB do not approve concealed sprinklers for quick response.*

- TY3551 (5 mm Bulb) is UL Listed, C-UL Listed, FM Approved, LPCB Approved (Ref. No. 094a/9), and NYC Approved (MEA 353-01-E) as Standard Response.

Approvals for Air and Dust Seal
UL and C-UL Listed for use with the RFII Standard Response Concealed Sprinkler (TY3551)

Maximum Working Pressure
Maximum 250 psi (17,3 bar) by UL, C-UL, and NYC

Maximum 175 psi (12,1 bar) by FM, VdS, and LPCB

Temperature Rating
155°F (68°C) Sprinkler with 139°F (59°C) Cover Plate

200°F (93°C) Sprinkler with 165°F (74°C) Cover Plate

Discharge Coefficient
K= 5.6 GPM/psi$^{1/2}$ (80,6 LPM/bar$^{1/2}$)

Adjustment
1/2 in. (12,7 mm)

Finishes
See the Ordering Procedure section.

Physical Characteristics

Frame	Bronze
Support Cup	Plated Steel
Guide Pins	Stainless Steel
Deflector	Bronze
Compression Screw	Brass
Bulb	Glass
Cap	Bronze or Copper
Sealing Assembly	Beryllium Nickel w/TEFLON
Cover Plate	Brass
Retainer	Brass
Ejection Spring	Stainless Steel

Design Criteria

The TYCO Series RFII 5.6 K-factor, "Royal Flush II" Concealed Pendent Sprinklers are intended for fire protection systems designed in accordance with the standard installation rules recognized by the applicable Listing or Approval agency; for example, UL Listing is based on NFPA 13 and VdS Approval is based on the CEA 4001.

For more information on LPCB and VdS Approvals, contact Johnson Controls at the following office:

Enschede, Netherlands
Telephone: 31-53-428-4444
Fax: 31-53-428-3377

The Series RFII Concealed Pendent Sprinklers are only listed and approved with the Series RFII Concealed Cover Plates having a factory applied finish.

NOTICE

Do not use the Series RFII in applications where the air pressure above the ceiling is greater than that below. Down drafts through the Sprinkler/Support Cup Assembly can delay sprinkler operation in a fire situation.

Operation

When exposed to heat from a fire, the Cover Plate, normally soldered to the Retainer at three points, falls away to expose the Sprinkler/Support Cup Assembly.

The Deflector — supported by the Guide Pins — then drops down to its operational position.

The glass bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, activating the sprinkler and allowing water to flow.

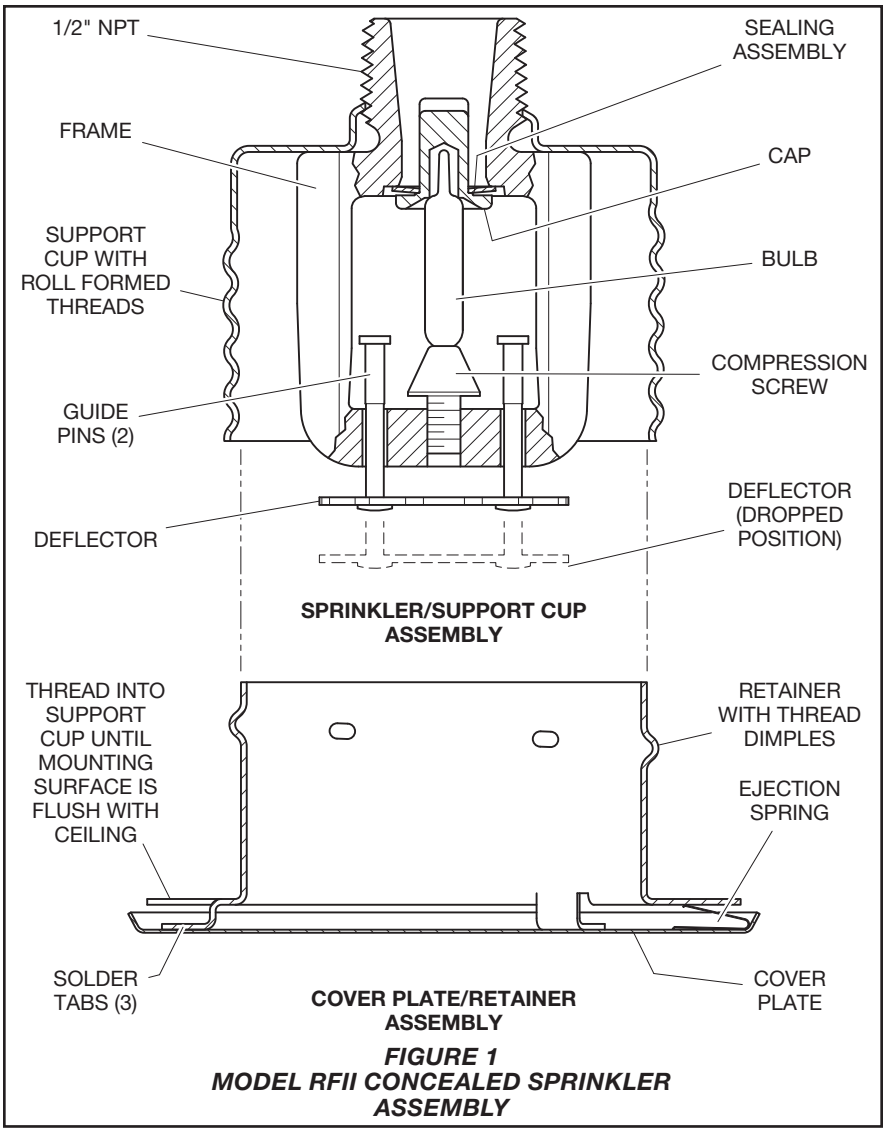


FIGURE 1
MODEL RFII CONCEALED SPRINKLER ASSEMBLY

Installation

The TYCO Series RFII 5.6 K-factor, "Royal Flush II" Concealed Pendent 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 1/16 in. (1,6 mm) for the 155°F (68°C) and 3/32 in. (2,4 mm) for the 200°F (93°C) temperature ratings.

A leak-tight 1/2 in. NPT sprinkler joint should be obtained by applying a minimum to maximum torque of 7 to 14 lb-ft (9,5 to 19,0 N·m). Higher levels of torque can distort the sprinkler Inlet with consequent leakage or impairment of the sprinkler.

Do not attempt to compensate for insufficient adjustment in the Sprinkler by under- or over-tightening the Sprinkler/Support Cup Assembly. Re-adjust the position of the sprinkler fitting to suit.

Step 1. Install the sprinkler only in the pendent position with the center-line of the sprinkler perpendicular to the mounting surface.

Step 2. Remove the Protective Cap.

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 RFII Sprinkler Wrench. See Figure 3. Apply the RFII Sprinkler Wrench to the Sprinkler as shown in Figure 3.

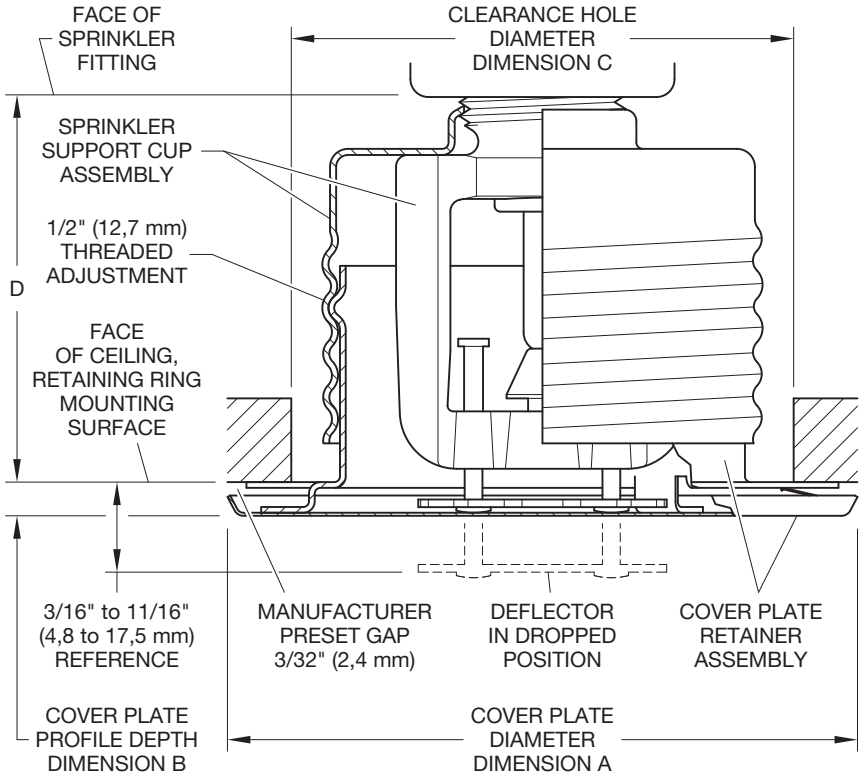


FIGURE 2
SERIES CONCEALED SPRINKLER INSTALLATION DIMENSIONS

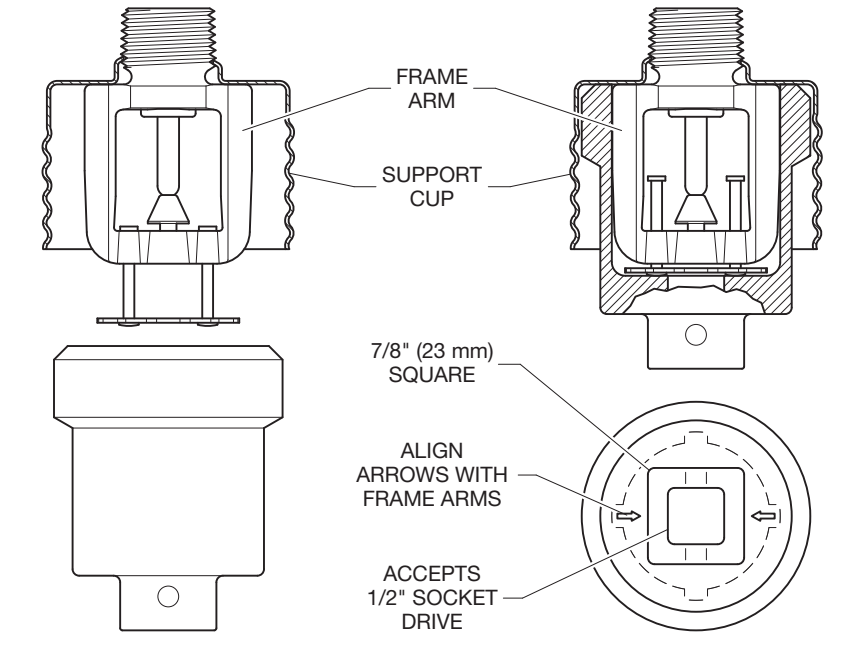


FIGURE 3
RFII SPRINKLER WRENCH

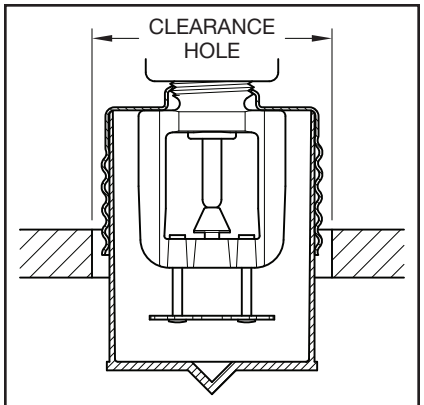


FIGURE 4
DISPOSABLE PROTECTIVE CAP

Step 5. Replace the Protective Cap by pushing it upwards until it bottoms out against the Support Cup. See Figure 4. The Protective Cap helps prevent damage to the Deflector and Arms during ceiling installation and/or finish. You can also use the Protective Cap to locate the center of the clearance hole by gently pushing the ceiling material up against the center point of the Protective Cap.

NOTICE

As long as the Protective Cap remains in place, the system is considered "Out of Service".

Step 6. After the ceiling has been completed with the 2-1/2 in. (63,5 mm) diameter clearance hole and in preparation for installing the Cover Plate/Retainer Assembly, remove and discard the Protective Cap. Verify that the Deflector moves up and down freely.

If the Sprinkler is damaged and the Deflector does not move up and down freely, replace the entire Sprinkler. Do not attempt to modify or repair a damaged sprinkler.

Step 7. When installing an Air and Dust Seal, see Figure 5; otherwise, proceed to Step 8. To attach the Air and Dust Seal, verify the angle of the outside edge of the seal is oriented according to Figure 5. Start the edge of the Retainer in the grooved slot of the Air and Dust Seal and continue around the retainer until the entire Air and Dust Seal is engaged.

Step 8. Screw on the Cover Plate/Retainer Assembly until the Retainer, shown in Figure 2, or the Air and Dust Seal, shown in Figure 5, contacts the ceiling. Do not continue to screw on the Cover Plate/Retainer Assembly so that it lifts a ceiling panel out of its normal position. If you cannot engage the Cover Plate/Retainer Assembly with the Support Cup or you cannot engage the Cover Plate/Retainer Assembly sufficiently to contact the ceiling, you must reposition the Sprinkler Fitting.

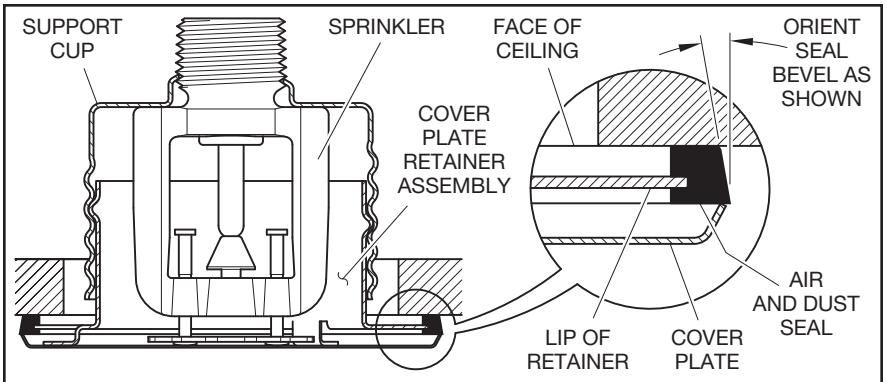


FIGURE 5
OPTIONAL AIR AND DUST SEAL FOR SERIES RFII (TY3551)

Care and Maintenance

The TYCO Series RFII 5.6 K-factor, "Royal Flush II" Concealed Pendent 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, obtain permission to shut down the affected fire protection system from the proper authorities and notify all personnel who may be affected by this action.

Absence of the Cover Plate/Retainer Assembly can delay sprinkler operation in a fire situation.

When properly installed, there is a nominal 3/32 in. (2,4 mm) air gap between the lip of the Cover Plate and the ceiling, as shown in Figure 2.

This air gap is necessary for proper operation of the sprinkler. If the ceiling requires repainting after sprinkler installation, ensure that the new paint does not seal off any of the air gap.

Do not pull the Cover Plate relative to the Enclosure. Separation may result.

Sprinklers which 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. See the Installation Section.

Exercise care to avoid damage to sprinklers before, during, and after installation. Replace sprinklers damaged by dropping, striking, wrench twisting, wrench slipping, or the like. Also, replace any sprinkler that has a cracked bulb or that has lost liquid from its bulb. See the Installation section.

If you must remove a sprinkler, do not reinstall it or a replacement without reinstalling the Cover Plate/Retainer Assembly. If a Cover Plate/Retainer Assembly becomes dislodged during service, replace it immediately.

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 NATIONAL FIRE PROTECTION ASSOCIATION, for example, NFPA 25, in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or sprinkler manufacturer regarding any questions.

Automatic sprinkler systems should be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national code.

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name.

Sprinkler/Support Cup Assembly
Specify: Series RFII (specify SIN), K=5.6, "Royal Flush II" Pendent Sprinklers (specify) temperature rating, P/N* (specify):

	155°F (68°C)	200°F (93°C)
TY3531	51-792-1-155	51-792-1-200
TY3551	51-790-1-155	51-790-1-200

* Use Suffix "I" for ISO 7-1 connection; for example, 51-792-1-155-I

Separately Ordered Cover Plate/ Retainer Assembly:
Specify: (temperature rating from below) Series RFII Concealed Cover Plate with (finish), P/N (specify).

	139°F (59°C)(a)	165°F (74°C)(b)
Grey White (RAL9002)	56-792-0-135	56-792-0-165
Brass	56-792-1-135	56-792-1-165
Pure White (c) (RAL9010)	56-792-3-135	56-792-3-165
Signal White (RAL9003)	56-792-4-135	56-792-4-165
Jet Black (RAL9005)	56-792-6-135	59-792-6-165
Brushed Chrome	56-792-8-135	56-792-8-165
Chrome	56-792-9-135	56-792-9-165
Custom	56-792-X-135	56-792-X-165

(a) For use with 155°F (68°C) sprinklers.
(b) For use with 200°F (93°C) sprinklers.
(c) Eastern Hemisphere sales only.

Sprinkler Wrench
Specify: RFII Sprinkler Wrench, P/N 56-000-1-075

Air and Dust Seal
Specify: Air and Dust Seal, P/N 56-908-1-001

1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700

Series TY-FRB – 5.6 and 8.0 K-factor Extended Coverage Horizontal Sidewall Sprinklers Quick and Standard Response (Light Hazard)

General Description

TYCO Series TY-FRB 5.6 and 8.0 K-factor Extended Coverage Horizontal Sidewall Sprinklers Quick and Standard Response (Light Hazard) are decorative 3 mm glass bulb type spray sprinklers designed for use in hydraulically calculated sprinkler systems in light hazard, commercial occupancies such as churches, restaurant seating areas, hotels, educational facilities, offices, etc. With their coverage up to 16 ft (4,9 m) wide by 24 ft (7,3 m) long, they are designed for installation along a wall or the side of a beam and just beneath a smooth ceiling. Horizontal sidewall (HSW) sprinklers are commonly used instead of pendent or upright sprinklers due to aesthetics or building construction considerations, where piping across the ceiling is not desirable.

The fast response thermal sensitivity rating of the Series TY-FRB, 3 mm bulb type sprinklers provides for a quick response extended coverage (QREC) rating for many of the coverage areas detailed in Tables B and C.

The recessed version of the Series TY-FRB Extended Coverage Horizontal Sidewall Sprinkler utilizes either a two-piece Style 10 (1/2 in. NPT) or Style 40 (3/4 in. NPT) Recessed Escutcheon with 1/2 in. (12,7 mm) of recessed adjustment or up to 3/4 in. (19,1 mm) of total adjustment from the flush sidewall position, or a two-piece Style 20 (1/2 in. NPT) or Style 30 (3/4 in. NPT) Recessed Escutcheon with 1/4 in. (6,4 mm) of recessed adjustment or up to 1/2 in. (12,7 mm) of total adjustment from the flush sidewall position. The adjustment provided by the Recessed Escutcheon reduces the accuracy to which the fixed pipe lengths to the sprinklers must be cut.

Corrosion resistant coatings, where applicable, are utilized to extend the life of copper alloy sprinklers beyond that which would otherwise be obtained when exposed to corrosive atmospheres. Although corrosion resistant coated sprinklers have passed the standard corrosion tests of the applicable approval agencies, the testing is not representative of all possible corrosive atmospheres. Consequently, it is recommended that the end user be consulted with respect to the suitability of these coatings for any given corrosive environment. The effects of ambient temperature, concentration of chemicals, and gas/chemical velocity, should be considered, as a minimum, along with the corrosive nature of the chemical to which the sprinklers will be exposed.

IMPORTANT

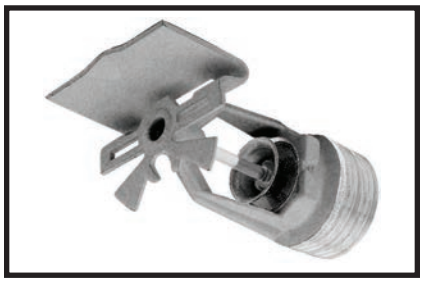
Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.

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

The Series TY-FRB Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (NFPA), 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)

- TY3332. . .EC HSW, 5.6K, 1/2 in. NPT
- TY4332. . .EC HSW, 8.0K, 3/4 in. NPT

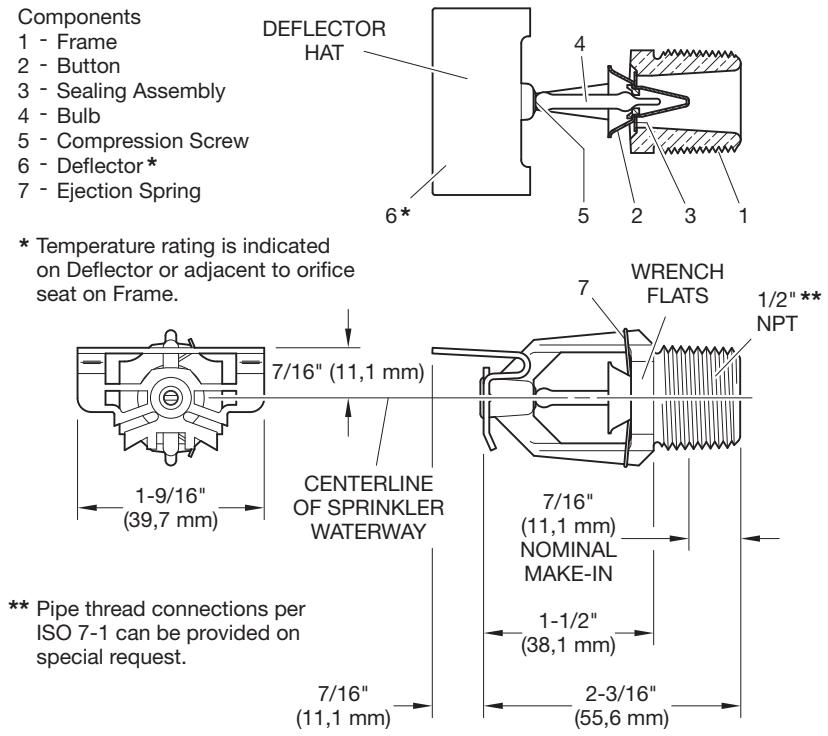


FIGURE 1
SERIES TY-FRB (TY3332)
EXTENDED COVERAGE
HORIZONTAL SIDEWALL SPRINKLER
5.6 K-FACTOR, 1/2 INCH NPT

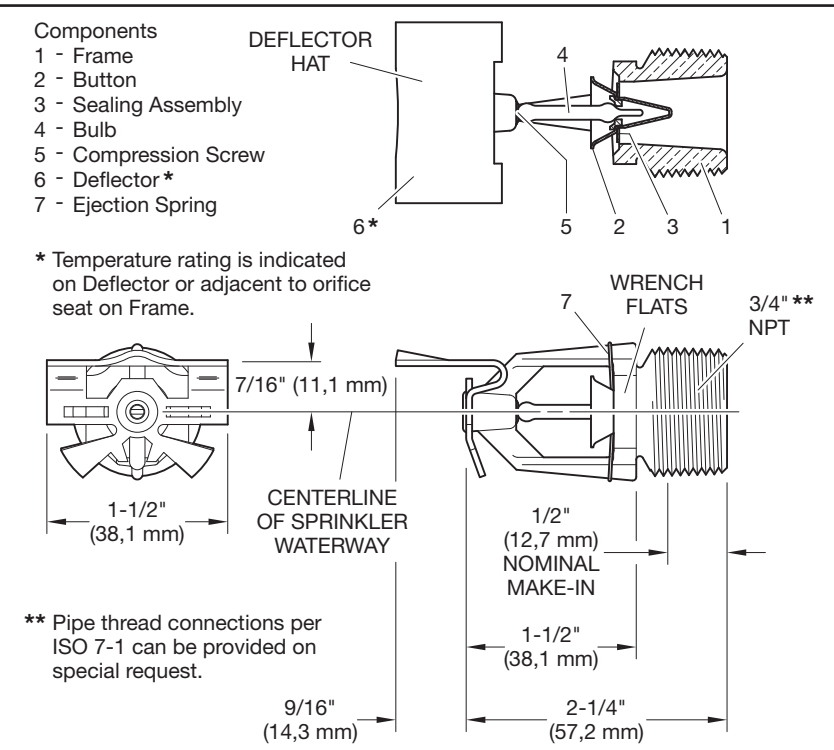


FIGURE 2
SERIES TY-FRB (TY4332)
EXTENDED COVERAGE
HORIZONTAL SIDEWALL SPRINKLER
8.0 K-FACTOR, 3/4 INCH NPT

Technical Data

Approvals
UL and C-UL Listed
FM and NYC Approved

(Refer to Table A for complete approval information including corrosion resistant status, as well as the Design Criteria section pertaining to special design considerations.)

Maximum Working Pressure
Refer to Table B.

Discharge Coefficient
K=5.6 gpm/psi$^{1/2}$ (80,6 lpm/bar$^{1/2}$)
K=8.0 gpm/psi$^{1/2}$ (115,2 lpm/bar$^{1/2}$)

Temperature Ratings
Refer to Table A.

Finishes
Sprinkler: Refer to Table E.

Recessed Escutcheon: White Coated, Chrome Plated, or Brass Plated

Physical Characteristics

Frame	Bronze
Button	Brass/Copper
Button	Brass/Copper
Sealing Assembly	Beryllium Nickel w/TEFLON
Bulb	Glass
Compression Screw	Bronze
Deflector	Copper

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.

Design Criteria

TYCO Series TY-FRB 5.6 and 8.0 K-factor Extended Coverage Horizontal Sidewall Sprinklers Quick and Standard Response (Light Hazard) must be installed and utilized in Light Hazard Occupancies, under smooth ceilings as outlined in the appliable installation standard recognized by the Approval Agency (e.g., UL recognizes NFPA 13, and FM recognize the FM Loss Prevention Data Sheets). Only the Style 10, 20, 30, or 40 Recessed Escutcheon, as applicable, is to be used for recessed installations.

K-FACTOR	SPRINKLER TYPE	TEMPERATURE RATING	BULB LIQUID COLOR	SPRINKLER FINISH[5]		
				NATURAL BRASS	CHROME PLATED	POLYESTER[c]
5.6 1/2 in. NPT	**EC HSW (TY3332)**	135°F (57°C)	Orange	1, 2, 3, 4		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
5.6 1/2 in. NPT	**RECESSED EC HSW[a] (TY3332)**	135°F (57°C)	Orange	1, 2,4		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
5.6 1/2 in. NPT	**RECESSED EC HSW[b] (TY3332)**	135°F (57°C)	Orange	1, 2, 3, 4		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
8.0 3/4 in. NPT	**EC HSW (TY4332)**	135°F (57°C)	Orange	1, 2, 3, 4		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
8.0 3/4 in. NPT	**RECESSED EC HSW[a] (TY4332)**	135°F (57°C)	Orange	1, 2, 4		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow	1, 2, 3, 4		
8.0 3/4 in. NPT	**RECESSED EC HSW[b] (TY4332)**	135°F (57°C)	Orange	1, 2, 3, 4		
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			

Notes:
1. Listed by Underwriters Laboratories, Inc. (UL) per Table C
2. Listed by Underwriters Laboratories, Inc. for use in Canada per Table C
3. Approved by Factory Mutual Research Corporation (FM) per Table D
4. Approved by the City of New York under MEA 354-01-E
5. Where Polyester Coated Sprinklers are noted to be UL and C-UL Listed, the sprinklers are UL and C-UL Listed corrosion-resistant sprinklers.

a. Installed with Style 10 (1/2 in. NPT) or Style 40 (3/4 in. NPT) 3/4 in. Total Adjustment Recessed Escutcheon, as applicable
b. Installed with Style 20 (1/2 in. NPT) or Style 30 (3/4 in. NPT) 1/2 in. Total Adjustment Recessed Escutcheon, as applicable
c. Frame and deflector only

TABLE A
LABORATORY LISTINGS AND APPROVALS
(Refer to the Design Criteria Section)

K-FACTOR	SPRINKLER TYPE	SPRINKLER FINISH		
		NATURAL BRASS	CHROME PLATED	POLYESTER
5.6 1/2 in. NPT	**EC HSW (TY3332)**	250 PSI (17, 2 BAR) OR 175 PSI (12,1 BAR) (SEE NOTE 1)		
	RECESSED EC HSW (TY3332)			
8.0 3/4 in. NPT	**EC HSW (TY4332)**			
	RECESSED EC HSW (TY4332)			

Notes:
1. The maximum working pressure of 250 psi (17,2 bar) only applies to the Listing by Underwriters Laboratories, Inc. (UL); the Listing by Underwriters Laboratories, Inc. for use in Canada (C-UL); and, the Approval by the City of New York.

TABLE B
MAXIMUM WORKING PRESSURE

5.6K EXTENDED COVERAGE HORIZONTAL SIDEWALL SPRINKLER (TY3332)

Response Rating	Coverage Area[1], ft x ft (m x m)	Minimum Flow[2], gpm (lpm)	Minimum Pressure[2], psi (bar)	Deflector-to-Ceiling Distance[3], Inches (mm)	Sprinkler Temperature Rating, °F	Minimum Spacing[4], ft (m)
Quick	16 x 16 (4,9 x 4,9)	26 (98)	21.6 (1,48)	4 to 12 (100 to 300)	135, 155, 175	10 (3,1)
Quick	16 x 18 (4,9 x 5,5)	29 (110)	26.8 (1,85)	4 to 12 (100 to 300)	135, 155, 175	10 (3,1)
Quick	16 x 20 (4.9 x 6,1)	32 (121)	32.7 (2,25)	4 to 6 (100 to 150)	135	10 (3,1)
Quick	16 x 22 (4,9 x 6,7)	35 (133)	39.1 (2,70)	4 to 6 (100 to 150)	135	10 (3,1)
Standard	16 x 20 (4,9 x 6,1)	32 (121)	32.7 (2,25)	4 to 6 (100 to 150)	155	10 (3,1)
Standard	16 x 22 (4,9 x 6,7)	35 (133)	39.1 (2,70)	4 to 6 (100 to 150)	155, 175	10 (3,1)

8.0K EXTENDED COVERAGE HORIZONTAL SIDEWALL SPRINKLER (TY4332)

Response Rating	Coverage Area[1], ft x ft (m x m)	Minimum Flow[2], gpm (lpm)	Minimum Pressure[2], psi (bar)	Deflector-to-Ceiling Distance[3], Inches (mm)	Sprinkler Temperature Rating, °F	Minimum Spacing[4], ft (m)
Quick	16 x 16 (4,9 x 4,9)	26 (98)	10.6 (0,73)	4 to 12 (100 to 300)	135, 155, 175	10 (3,1)/13 (4,0)[5]
Quick	16 x 18 (4,9 x 5,5)	29 (110)	13.1 (0,90)	4 to 12 (100 to 300)	135, 155, 175	10 (3,1)/13 (4,0)[5]
Quick	16 x 20 (4.9 x 6,1)	32 (121)	16.0 (1,10)	4 to 6 (100 to 150)	135	10 (3,1)/13 (4,0)[5]
Quick	16 x 20 (4.9 x 6,1)	33 (125)	17.0 (1,17)	4 to 12 (100 to 300)	135	10 (3,1)/13 (4,0)[5]
Quick	16 x 22 (4,9 x 6,7)	35 (133)	19.1 (1,32)	4 to 6 (100 to 150)	135	10 (3,1)/13 (4,0)[5]
Quick	16 x 22 (4,9 x 6,7)	36 (136)	20.3 (1,59)	4 to 12 (100 to 300)	135	10 (3,1)/13 (4,0)[5]
Quick	16 x 24 (4,9 x 7,3)	39 (148)	23.8 (1,64)	4 to 6 (100 to 150)	135	10 (3,1)/13 (4,0)[5]
Quick	16 x 24 (4,9 x 7,3)	40 (151)	25.0 (1,72)	4 to 12 (100 to 300)	135	10 (3,1)/13 (4,0)[5]
Standard	16 x 20 (4.9 x 6,1)	32 (121)	16.0 (1,10)	4 to 6 (100 to 150)	155	10 (3,1)/13 (4,0)[5]
Standard	16 x 20 (4.9 x 6,1)	33 (125)	17.0 (1,17)	4 to 12 (100 to 300)	155	10 (3,1)/13 (4,0)[5]
Standard	16 x 22 (4,9 x 6,7)	35 (133)	19.1 (1,32)	4 to 6 (100 to 150)	155, 175	10 (3,1)/13 (4,0)[5]
Standard	16 x 22 (4,9 x 6,7)	36 (136)	20.3 (1,59)	4 to 12 (100 to 300)	155, 175	10 (3,1)/13 (4,0)[5]
Standard	16 x 24 (4,9 x 7,3)	39 (148)	23.8 (1,64)	4 to 6 (100 to 150)	155, 175	10 (3,1)/13 (4,0)[5]
Standard	16 x 24 (4,9 x 7,3)	40 (151)	25.0 (1,72)	4 to 12 (100 to 300)	155, 175	10 (3,1)/13 (4,0)[5]

Notes:
1. Backwall (where sprinkler is located) by sidewall (length of throw)
2. Requirement is based on minimum flow in gpm from each sprinkler. The indicted residual pressures are based on the nominal K-factor.
3. The centerline of the sprinkler waterway is located 7/16 in. (11,1 mm) below the deflector (Ref. Figures 1 and 2).
4. Minimum spacing is for lateral distance between sprinklers located along a single wall, otherwise adjacent sprinklers (i.e., sidewall sprinklers on an adjacent wall, on an opposite wall, or pendent sprinklers) must be located outside of the maximum listed protection area of the extended coverage sidewall sprinkler being utilized.
5. Minimum spacing is 13 ft (4,0 m) when design pressure exceeds 175 psi (12,1 bar), otherwise the minimum spacing is 10 ft (3 m).

TABLE C
UL AND C-UL LISTING COVERAGE AND FLOW RATE CRITERIA

5.6K EXTENDED COVERAGE HORIZONTAL SIDEWALL SPRINKLER (TY3332)

Response Rating	Coverage Area[1], ft x ft (m x m)	Minimum Flow[2], gpm (lpm)	Minimum Pressure[2], psi (bar)	Deflector-to-Ceiling Distance[3], Inches (mm)	Sprinkler Temperature Rating, °F	Minimum Spacing[4], ft (m)
Quick	16 x 16 (4,9 x 4,9)	26 (98)	22 (1,51)	4 to 12 (100 to 300)	135, 155	10 (3,1)
Quick	16 x 18 (4,9 x 5,5)	30 (114)	29 (2,00)	4 to 12 (100 to 300)	135, 155	10 (3,1)
Quick	16 x 20 (4.9 x 6,1)	33 (125)	35 (2,41)	4 to 12 (100 to 300)	135, 155	10 (3,1)
Standard	16 x 16 (4,9 x 4,9)	26 (98)	22 (1,51)	4 to 12 (100 to 300)	175	10 (3,1)
Standard	16 x 20 (4,9 x 6,1)	30 (114)	29 (2,00)	4 to 12 (100 to 300)	175	10 (3,1)
Standard	16 x 22 (4,9 x 6,7)	33 (125)	35 (2,41)	4 to 12 (100 to 300))	175	10 (3,1)

8.0K EXTENDED COVERAGE HORIZONTAL SIDEWALL SPRINKLER (TY4332)

Response Rating	Coverage Area[1], ft x ft (m x m)	Minimum Flow[2], gpm (lpm)	Minimum Pressure[2], psi (bar)	Deflector-to-Ceiling Distance[3], Inches (mm)	Sprinkler Temperature Rating, °F	Minimum Spacing[4], ft (m)
Quick	16 x 16 (4,9 x 4,9)	32 (121)	16 (1,10)	4 to 12 (100 to 300)	135, 155	10 (3,1)
Quick	16 x 18 (4,9 x 5,5)	36 (136)	20 (1,38)	4 to 12 (100 to 300)	135, 155	10 (3,1)
Quick	16 x 20 (4.9 x 6,1)	40 (151)	25 (1,72)	4 to 12 (100 to 300)	135, 155	10 (3,1)
Quick	16 x 22 (4,9 x 6,7)	44 (167)	30 (2,06)	4 to 12 (100 to 300)	135, 155	10 (3,1)
Quick	16 x 24 (4,9 x 6,7)	48 (182)	36 (2,48)	4 to 12 (100 to 300)	135, 155	10 (3,1)
Standard	16 x 16 (4,9 x 4,9)	32 (121)	16 (1,10)	4 to 12 (100 to 300))	175	10 (3,1)
Standard	16 x 18 (4,9 x 5,5)	36 (136)	20 (1,38)	4 to 12 (100 to 300)	175	10 (3,1)
Standard	16 x 20 (4.9 x 6,1)	40 (151)	25 (1,72)	4 to 12 (100 to 300))	175	10 (3,1)
Standard	16 x 22 (4,9 x 6,7)	44 (167)	30 (2,06)	4 to 12 (100 to 300)	175	10 (3,1)
Standard	16 x 24 (4,9 x 6,7)	48 (182)	36 (2,48)	4 to 12 (100 to 300)	175	10 (3,1)

Notes:
1. Backwall (where sprinkler is located) by sidewall (length of throw)
2. Requirement is based on maintaining both minimum flow and minimum residual pressure.
3. The centerline of the sprinkler waterway is located 7/16 in. (11,1 mm) below the deflector (Ref. Figures 1 and 2).
4. Minimum spacing is for lateral distance between sprinklers located along a single wall, otherwise adjacent sprinklers (i.e., sidewall sprinklers on an adjacent wall, on an opposite wall, or pendent sprinklers) must be located outside of the maximum listed protection area of the extended coverage sidewall sprinkler being utilized.

TABLE D
FM COVERAGE AND FLOW RATE CRITERIA

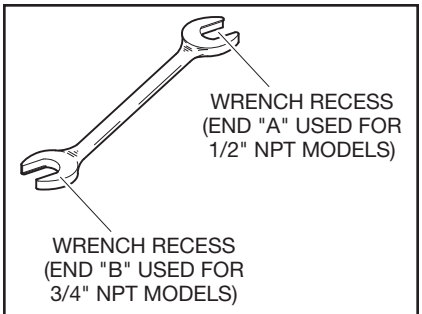


FIGURE 3
W-TYPE 6
SPRINKLER WRENCH

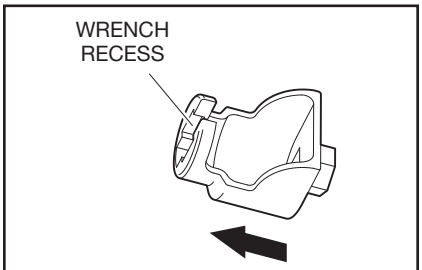


FIGURE 4
W-TYPE 7 RECESSED
SPRINKLER WRENCH

Installation

TYCO Series TY-FRB 5.6 and 8.0 K-factor Extended Coverage Horizontal Sidewall Sprinklers Quick and Standard Response (Light Hazard) must be installed in accordance with this section.

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 1/16 in. (1,6 mm).

A leak tight 1/2 inch NPT sprinkler joint should be obtained with a torque of 7 to 14 lb-ft (9,5 to 19,0 N·m). A leak tight 3/4 in. NPT sprinkler joint should be obtained with a torque of 10 to 20 lb-ft (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.

Series TY-FRB EC
Sidewall Sprinkler
The Series TY-FRB EC Sidewall Sprinklers must be installed in accordance with the following instructions:

Step 1. Horizontal sidewall sprinklers are to be installed with their centerline perpendicular to the back wall and parallel to the ceiling. The word “TOP” on the deflector is to face towards the ceiling.

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 3). With reference to Figures 1 and 2, the W-Type 6 Sprinkler Wrench is to be applied to the sprinkler wrench flats.

Series TY-FRB Recessed EC
Sidewall Sprinkler
The Series TY-FRB Recessed EC Sidewall Sprinklers must be installed in accordance with the following instructions:

Step 1. Horizontal sidewall sprinklers are to be installed with their centerline perpendicular to the back wall and parallel to the ceiling. The word “TOP” on the deflector is to face towards the ceiling.

Step 2. After installing the Style 10, 20, 30, or 40 Mounting Plate, as applicable, over the sprinkler threads and 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 7 Recessed Sprinkler Wrench (Ref. Figure 4). With reference to Figure 1 or 2, the W-Type 7 Recessed Sprinkler Wrench is to be applied to the sprinkler wrench flats.

Step 4. After the wall has been installed or the finish coat has been applied, slide on the Style 10, 20, 30, or 40. Closure over the Series TY-FRB Sprinkler and push the Closure over the Mounting Plate until its flange comes in contact with the wall.

Care and Maintenance

TYCO Series TY-FRB 5.6 and 8.0 K-factor Extended Coverage Horizontal Sidewall Sprinklers Quick and Standard Response (Light Hazard) 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.

The owner must assure that the sprinklers are not used for hanging of any objects; otherwise, non-operation in the event of a fire or inadvertent operation may result.

Absence of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

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. (Refer to Installation Section.)

Frequent visual inspections are recommended to be initially performed for corrosion resistant coated sprinklers, after the installation has been completed, to verify the integrity of the corrosion resistant coating. Thereafter, annual inspections per NFPA 25 should suffice; however, instead of inspecting from the floor level, a random sampling of close-up visual inspections should be made, so as to better determine the exact sprinkler condition and the long term integrity of the corrosion resistant coating, as it may be affected by the corrosive conditions present.

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 National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other authorities having jurisdiction. Contact the installing contractor or product 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.

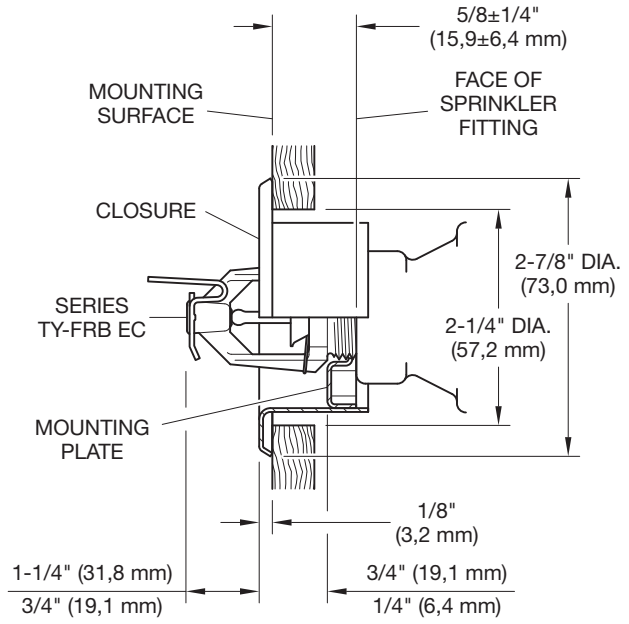


FIGURE 5
SERIES TY-FRB RECESSED EC SIDEWALL SPRINKLER ASSEMBLY WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT STYLE 10 RECESSED ESCUTCHEON 5.6 K-FACOTR, 1/2 INCH NPT

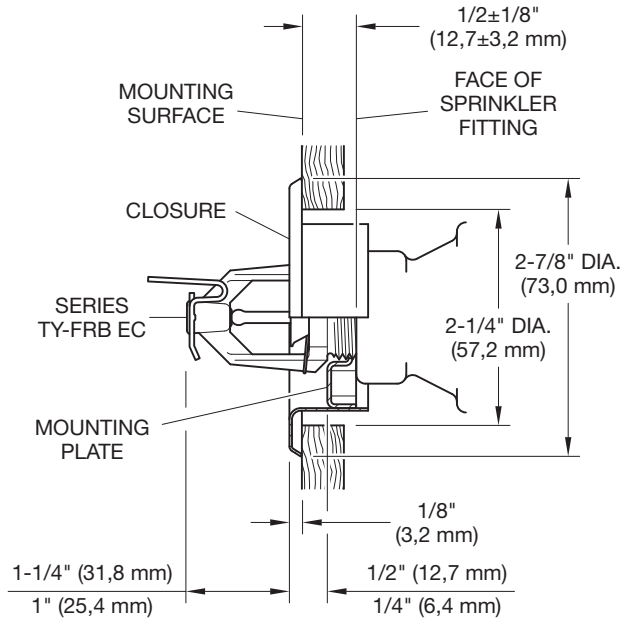


FIGURE 6
SERIES TY-FRB RECESSED EC SIDEWALL SPRINKLER ASSEMBLY WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT STYLE 20 RECESSED ESCUTCHEON 5.6 K-FACTOR, 1/2 INCH NPT

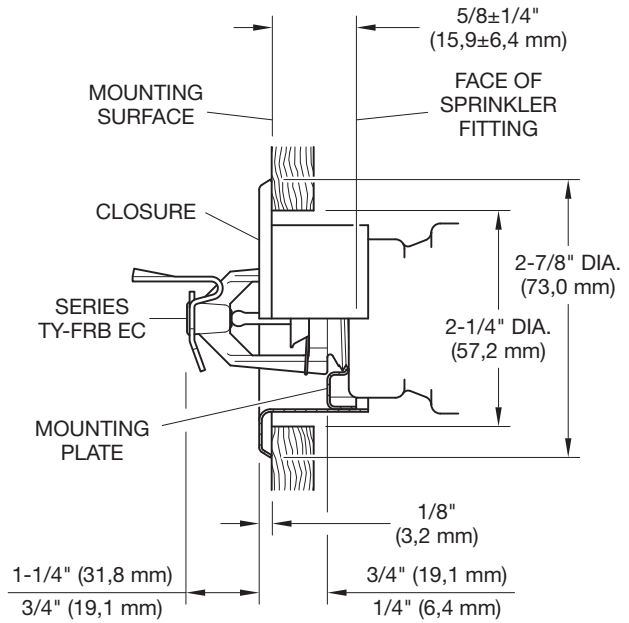


FIGURE 7
SERIES TY-FRB RECESSED EC SIDEWALL SPRINKLER ASSEMBLY WITH TWO-PIECE 3/4 INCH TOTAL ADJUSTMENT STYLE 40 RECESSED ESCUTCHEON 8.0 K-FACTOR, 3/4 INCH NPT

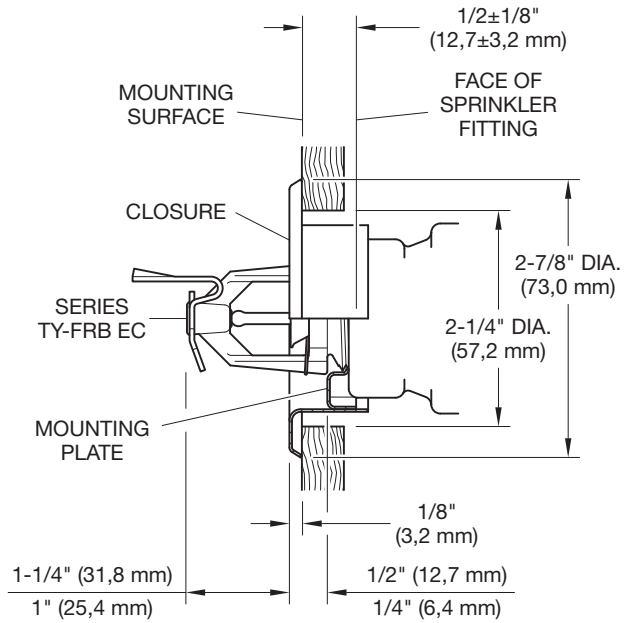


FIGURE 8
SERIES TY-FRB RECESSED EC SIDEWALL SPRINKLER ASSEMBLY WITH TWO-PIECE 1/2 INCH TOTAL ADJUSTMENT STYLE 30 RECESSED ESCUTCHEON 8.0 K-FACTOR, 3/4 INCH NPT

57 - XXX - X - XXX

		SIN
376	5.6K EC HSW	TY3332
396	8.0K EC HSW	TY4332

	SPRINKLER FINISH
1	NATURAL BRASS
3	PURE WHITE (RAL9010) POLYESTER
4	SIGNAL WHITE (RAL9003) POLYESTER
5	JET BLACK (RAL9005) POLYESTER
9	CHROME PLATED

	TEMPERATURE RATING
135	135°F (57°C)
155	155°F (68°C)
175	175°F (79°C)

TABLE E
SERIES TY-FRB EXTENDED COVERAGE HORIZONTAL SIDEWALL SPRINKLERS
PART NUMBER SELECTION

Limited Warranty

For warrany terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

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

Sprinkler Assembly with NPT Thread Connections
Specify: Series TY-FRB, (specify SIN), Extended Coverage Horizontal Sidewall Sprinkler, K=(specify), (specify) temperature rating, (specify) finish, P/N (specify from Table E)

Recessed Escutcheon
Specify: Style (10, 20, 30, or 40) Recessed Escutcheon with (specify*) finish, P/N (specify*)
* Refer to Technical Data Sheet TFP770

Sprinkler Wrench
Specify: W-Type 6 Sprinkler Wrench, P/N 56-000-6-387

Specify: W-Type 7 Sprinkler Wrench, P/N 56-850-4-001

1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700

Series DS-1 – 5.6 K-factor, Dry-type Sprinklers Pendent, Upright, and Horizontal Sidewall Standard Response, Standard Coverage

General Description

TYCO Series DS-1 5.6K Pendent, Upright, and Horizontal Sidewall, Standard Response (5 mm bulb), Standard Coverage Dry-type Sprinklers are decorative glass bulb automatic sprinklers typically used where:

- pendent sprinklers are required on dry pipe systems that are exposed to freezing temperatures (e.g., sprinkler drops from unheated portions of buildings)
- sprinklers and/or a portion of the connecting piping may be exposed to freezing temperatures (e.g., sprinkler drops from wet systems into freezers, sprinkler sprigs from wet systems into unheated attics, or horizontal piping extensions through a wall to protect unheated areas of a building such as loading docks, overhangs, and building exteriors)
- sprinklers are used on systems that are seasonably drained to avoid freezing (e.g., vacation resort areas)

NOTICE

Series DS-1 Dry-type Sprinklers described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (NFPA), in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

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.

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.

Series DS-1 Dry-type Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section.

Sprinkler Identification Numbers (SINs)

TY3255 – Pendent
~~TY3155 – Upright~~
TY3355 – Horizontal Sidewall

Technical Data

Approvals
UL and C-UL Listed
FM Approved
VdS Approved
TY3255 w/Standard Escutcheon only
NYC Approved
under MEA 352-01-E
LPCB Approved
Reference No. 094a/11
CE Certified
Certificate of Conformity No. 0832-CPD-2015

(Refer to Tables A and B for details.)

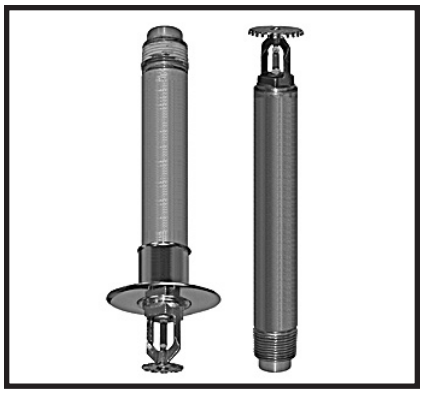
Maximum Working Pressure
175 psi (12,1 bar)

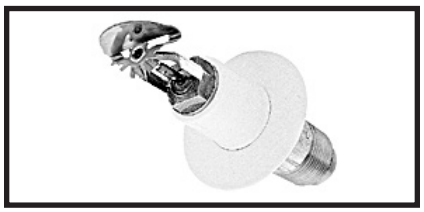
Inlet Thread Connections
1 inch NPT
ISO 7-R 1

Discharge Coefficient
K=5.6 gpm/psi$^{1/2}$ (80,6 lpm/bar$^{1/2}$)

Temperature Ratings
Refer to Tables A and B.

Finishes
Sprinkler: Refer to Table D.
Escutcheon: Refer to Table D.





Physical Characteristics

Inlet	Copper
Plug	Copper
Yoke	Stainless Steel
Casing	Galvanized Carbon Steel
Insert	Bronze
Bulb Seat	Stainless Steel
Bulb (5 mm dia.)	Glass
Compression Screw	Bronze
Deflector	Bronze
Frame	Bronze
Guide Tube	Stainless Steel
Water Tube	Stainless Steel
Spring	Stainless Steel
Sealing Assembly	Beryllium Nickel w/TEFLON
Escutcheon	Carbon Steel

SPRINKLER TYPE	ESCUTCHEON TYPE	TEMPERATURE RATING	BULB COLOR CODE	SPRINKLER FINISH		
				NATURAL BRASS	CHROME PLATED	POLYESTER*
PENDENT (TY3255)	STANDARD	135°F (57°C)	Orange	1, 2, 3, 4, 5, 6		1, 2, 4, 5, 6
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
		286°F (141°C)	Blue			
		360°F (182°C)	Mauve	1, 2, 3, 6		1, 2, 6
	RECESSED	135°F (57°C)	Orange	1, 2, 3, 5		1, 2, 5
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
		286°F (141°C)	Blue	1, 2		
		360°F (182°C)	Mauve	N/A		
	DEEP	135°F (57°C)	Orange	1, 2, 3, 4, 5		1, 2, 4, 5
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
		286°F (141°C)	Blue			
		360°F (182°C)	Mauve			
	WITHOUT	135°F (57°C)	Orange			
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
		286°F (141°C)	Blue			
		360°F (182°C)	Mauve	1, 2, 3		1, 2
UPRIGHT (TY3155)	WITHOUT	135°F (57°C)	Orange	1, 2, 3, 4, 5		1, 2, 4, 5
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
		286°F (141°C)	Blue			
		360°F (182°C)	Mauve	1, 2, 3		1, 2

Notes:
1. Listed by Underwriters Laboratories, Inc. (UL), maximum order length of 48 inches
2. Listed by Underwriters Laboratories for use in Canada (C-UL), maximum order length of 48 inches
3. Approved by FM Global (FM Approvals), maximum order length of 48 inches
4. Loss Prevention Certification Board (LPCB) and CE conformity apply to these temperature ratings only
5. Approved by the City of New York under MEA 352-01-E
6. Approved by VdS

* Frame and deflector only

N/A – Not Applicable

TABLE A
SERIES DS-1 PENDENT & UPRIGHT DRY-TYPE SPRINKLERS, 5.6K, STANDARD RESPONSE
LABORATORY LISTINGS AND APPROVALS

SPRINKLER TYPE	ESCUTCHEON TYPE	TEMPERATURE RATING	BULB COLOR CODE	SPRINKLER FINISH		
				NATURAL BRASS	CHROME PLATED	POLYESTER***
HSW* (TY3355)	STANDARD	135°F (57°C)	Orange	1**, 2**, 3***, 4, 5		1**, 2**, 4, 5
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
		286°F (141°C)	Blue			
		360°F (182°C)	Mauve			
	DEEP	135°F (57°C)	Orange			
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
		286°F (141°C)	Blue			
		360°F (182°C)	Mauve			
	WITHOUT	135°F (57°C)	Orange			
		155°F (68°C)	Red			
		175°F (79°C)	Yellow			
		200°F (93°C)	Green			
		286°F (141°C)	Blue			
		360°F (182°C)	Mauve	1**, 2**, 5		1**, 2**

Notes:
1. Listed by Underwriters Laboratories, Inc. (UL), maximum order length of 48 inches
2. Listed by Underwriters Laboratories for use in Canada (C-UL), maximum order length of 48 inches
3. Approved by FM Global (FM Approvals), maximum order length of 48 inches
4. Loss Prevention Certification Board (LPCB) and CE conformity apply to these temperature ratings only
5. Approved by the City of New York under MEA 352-01-E

* Horizontal sidewall with top of deflector-to-ceiling distance of 4 to 12 inches (100 to 300 mm)
** Light and ordinary hazard occupancies only
*** Light hazard occupancies only
**** Frame and deflector only

TABLE B
SERIES DS-1 HORIZONTAL SIDEWALL (HSW) DRY-TYPE SPRINKLER, 5.6K, STANDARD RESPONSE
LABORATORY LISTINGS AND APPROVALS

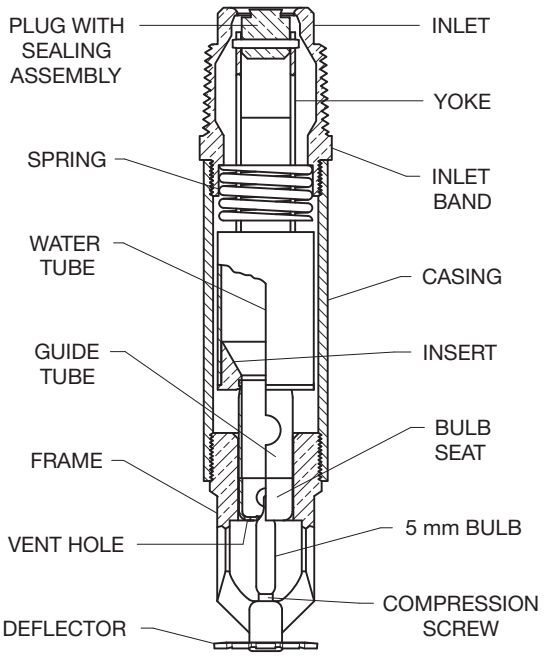


FIGURE 1
SERIES DS-1 DRY-TYPE SPRINKLER, 5.6K, STANDARD RESPONSE ASSEMBLY

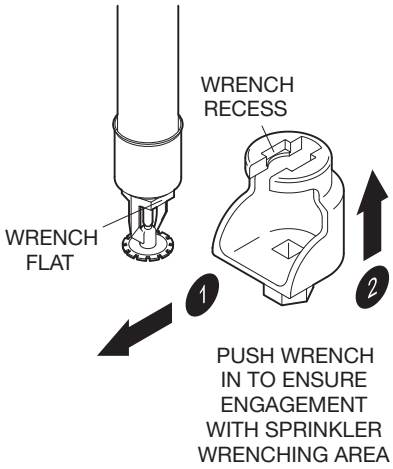


FIGURE 2
W-TYPE 7 WRENCH

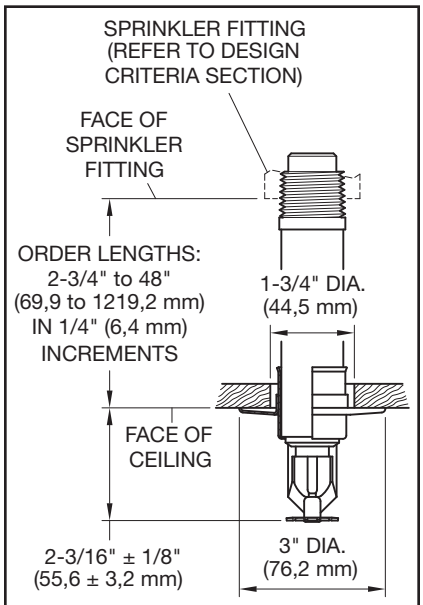


FIGURE 3
PENDENT (TY3255)
WITH STANDARD ESCUTCHEON

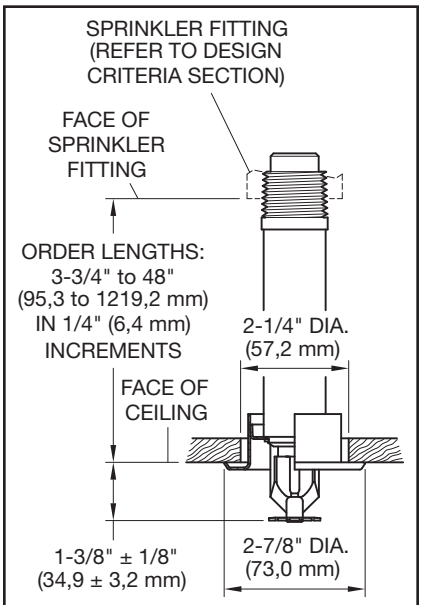


FIGURE 4
PENDENT (TY3255)
WITH STANDARD
RECESSED ESCUTCHEON

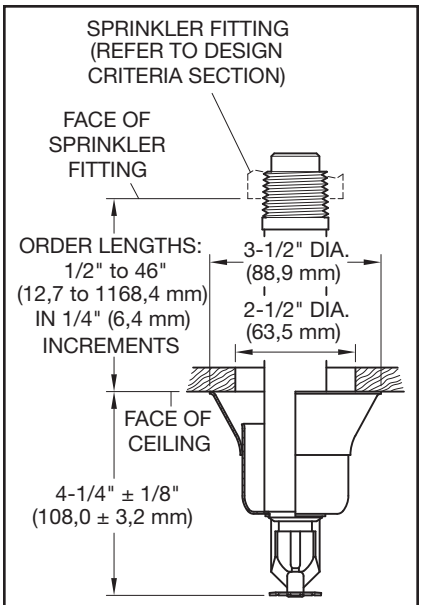


FIGURE 5
PENDENT (TY3255)
WITH DEEP ESCUTCHEON

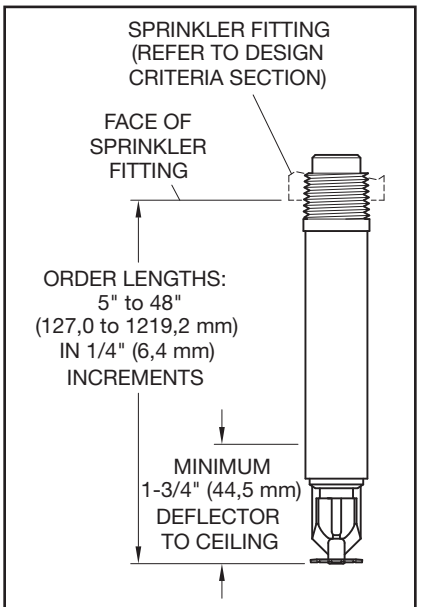


FIGURE 6
PENDENT (TY3255)
WITHOUT ESCUTCHEON

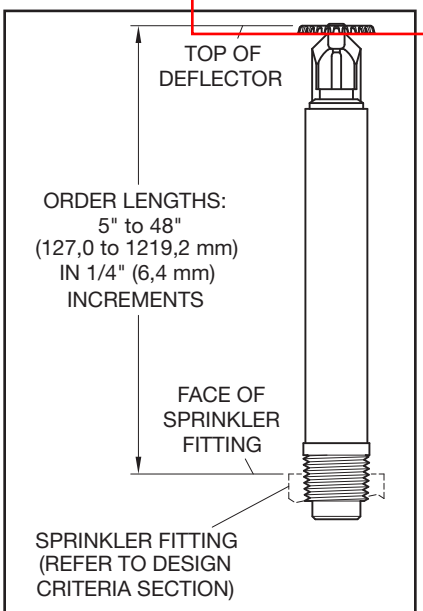


FIGURE 7
UPRIGHT (TY3155)
WITHOUT ESCUTCHEON

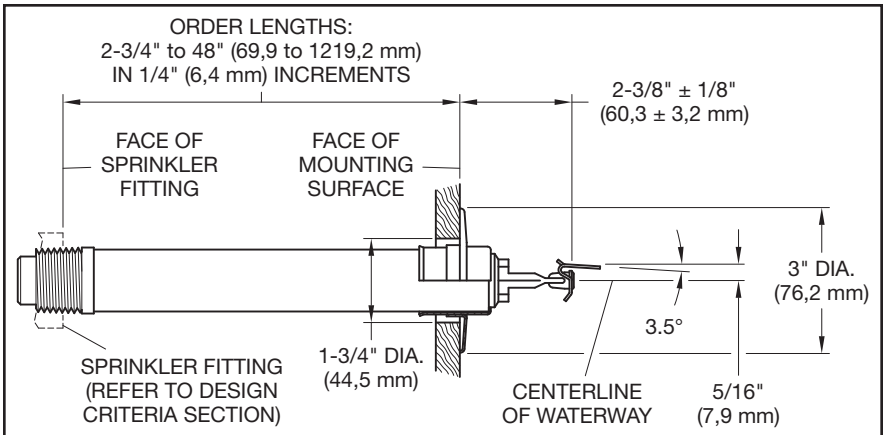


FIGURE 8
HORIZONTAL SIDEWALL (TY3355)
WITH STANDARD ESCUTCHEON

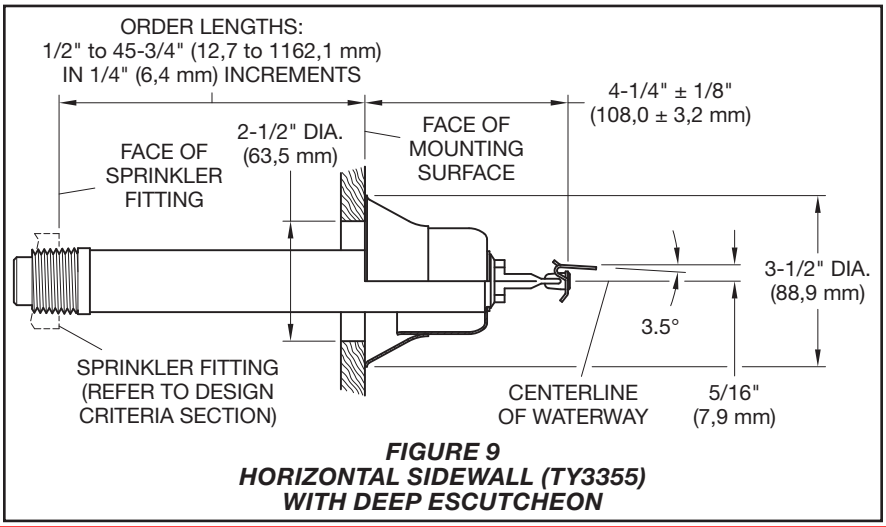


FIGURE 9
HORIZONTAL SIDEWALL (TY3355)
WITH DEEP ESCUTCHEON

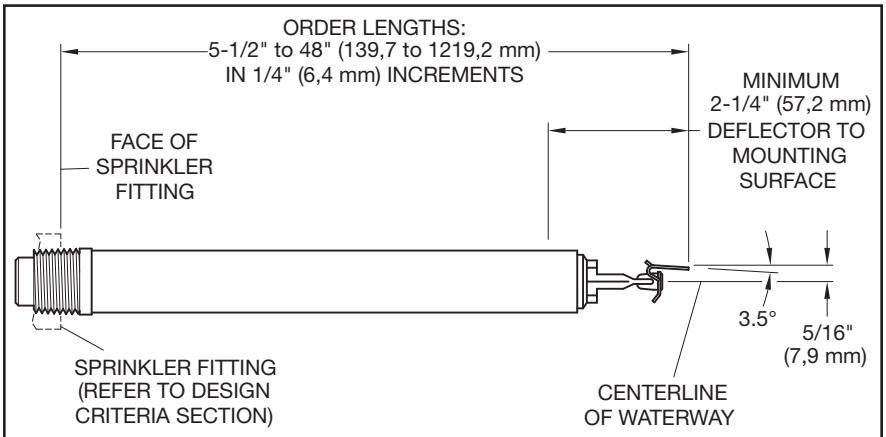


FIGURE 10
HORIZONTAL SIDEWALL (TY3355)
WITHOUT ESCUTCHEON

Operation

When TYCO Series DS-1 5.6K Pendent, Upright, and Horizontal Sidewall, Standard Response, Standard Coverage Dry-type Sprinklers are in service, water is prevented from entering the assembly by the Plug with Sealing Assembly (Ref. Figure 1) in the Inlet of the sprinkler.

The glass bulb contains a fluid that expands when exposed to heat. When the rated temperature is reached, the fluid expands sufficiently to shatter the glass bulb, and the Bulb Seat is released.

The compressed Spring is then able to expand and push the Water Tube as well as the Guide Tube outward. This action simultaneously pulls inward on the Yoke, withdrawing the Plug with Sealing Assembly from the Inlet, allowing the sprinkler to activate and flow water.

Design Criteria

TYCO Series DS-1 5.6K Pendent, Upright, and Horizontal Sidewall, Standard Response, Standard Coverage Dry-type Sprinklers are intended for use in fire sprinkler systems designed in accordance with the standard installation rules recognized by the applicable listing or approval agency (e.g., UL Listing is based on NFPA 13 requirements). For more information on LPCB Approval, contact Tyco Fire Suppression & Building Products at the following office:

Kopersteden 1
7547 TJ Enschede
The Netherlands
Tel: +31-(0)53-428-4444
Fax: +31-(0)53-428-3377

Sprinkler Fittings

Install 1 inch NPT Series DS-1 Dry-type Sprinklers in the 1 inch NPT outlet or run of the following fittings:

- malleable or ductile iron threaded tee fittings that meet the dimensional requirements of ANSI B16.3 (Class 150)
- cast iron threaded tee fittings that meet the dimensional requirements of ANSI B16.4 (Class 125)

Do not install Series DS-1 Dry-type Sprinklers into elbow fittings. The Inlet of the sprinkler can contact the interior of the elbow.

The unused outlet of the threaded tee is plugged as shown in Figure 12.

Ambient Temperature Exposed to Discharge End of Sprinkler	Temperatures for Heated Area[1]		
	40°F (4°C)	50°F (10°C)	60°F (16°C)
	Minimum Exposed Barrel Length[2], Inches (mm)		
40°F (4°C)	0	0	0
30°F (-1°C)	0	0	0
20°F (-7°C)	4 (100)	0	0
10°F (-12°C)	8 (200)	1 (25)	0
0°F (-18°C)	12 (305)	3 (75)	0
-10°F (-23°C)	14 (355)	4 (100)	1 (25)
-20°F (-29°C)	14 (355)	6 (150)	3 (75)
-30°F (-34°C)	16 (405)	8 (200)	4 (100)
-40°F (-40°C)	18 (455)	8 (200)	4 (100)
-50°F (-46°C)	20 (510)	10 (255)	6 (150)
-60°F (-51°C)	20 (510)	10 (255)	6 (150)

Notes:
1. For protected area temperatures that occur between values listed above, use the next cooler temperature.
2. These lengths are inclusive of wind velocities up to 30 mph (18,6 kph).

TABLE C
EXPOSED SPRINKLER BARRELS IN WET PIPE SYSTEMS
MINIMUM RECOMMENDED LENGTHS

You can also install Series DS-1 Dry-type Sprinklers in the 1 inch NPT outlet of a GRINNELL Figure 730 Mechanical Tee and GRINNELL G-FIRE Figure 522; however, the use of the Figure 730 Tee and Figure 522 for this arrangement is limited to wet pipe systems.

The configuration shown in Figure 13 is only applicable for wet pipe systems where the sprinkler fitting and water-filled pipe above the sprinkler fitting are not subject to freezing and where the length of the dry-type sprinkler has the minimum exposure length depicted in Figure 11. Refer to the Exposure Length section.

For wet pipe system installations of 1 inch NPT Series DS-1 Dry-Type Sprinklers connected to CPVC piping, use only the following TYCO CPVC fittings:

- 1" x 1" NPT Female Adapter (P/N 80145)
- 1" x 1" x 1" NPT Sprinkler Head Adapter Tee (P/N 80249)

For dry pipe system installations, use only the side outlet of maximum 2-1/2 inch reducing tee when locating Series DS-1 Dry-type Sprinklers directly below the branchline; otherwise, use the configuration shown in Figure 12 to assure complete water drainage from above Series DS-1 Dry-type Sprinklers and the branchline. Failure to do so may result in pipe freezing and water damage.

NOTICE

Do not install Series DS-1 Dry-type Sprinklers into any other type fitting without first consulting the Tyco Fire Protection Products (TFPP) Technical Services. Failure to use the appropriate fitting may result in one of the following:

- *failure of the sprinkler to operate properly due to formation of ice over the Inlet Plug or binding of the Inlet Plug*
- *insufficient engagement of the Inlet pipe-threads with consequent leakage*

Drainage

In accordance with the minimum requirements of the National Fire Protection Association for dry pipe sprinkler systems, branch, cross, and feed-main piping connected to Dry Sprinklers and subject to freezing temperatures must be pitched for proper drainage.

Exposure Length

When using Dry Sprinklers in wet pipe sprinkler systems to protect areas subject to freezing temperatures, use Table C to determine a sprinkler's appropriate exposed barrel length to prevent water from freezing in the connecting pipes due to conduction. The exposed barrel length measurement must be taken from the face of the sprinkler fitting to the surface of the structure or insulation that is exposed to the heated area. Refer to Figure 11 for an example.

For protected area temperatures between those given above, the minimum recommended length from the face of the fitting to the outside of the protected area may be determined by interpolating between the indicated values.

Clearance Space

In accordance with Section 8.4.9.2 of the 2010 edition of NFPA 13, when connecting an area subject to freezing and an area containing a wet pipe sprinkler system, the clearance space around the sprinkler barrel of dry-type sprinklers must be sealed. Due to temperature differences between two areas, the potential for the formation of condensation in the sprinkler and subsequent ice build-up is increased. If this condensation is not controlled, ice build-up can occur that might damage the dry-type sprinkler and/or prevent proper operation in a fire situation.

Use of the Model DSB-2 Dry Sprinkler Boot, described in technical data sheet TFP591 and shown in Figures 14 and 15, can provide the recommended seal.

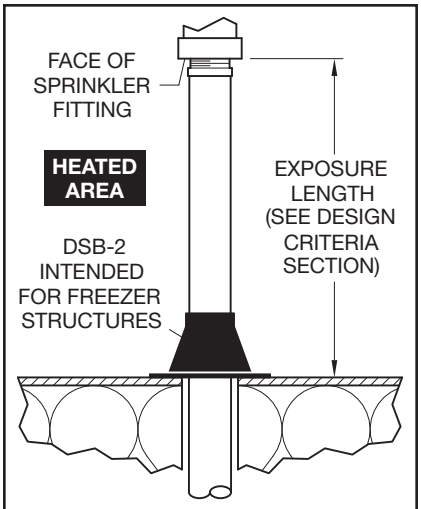


FIGURE 11
EXPOSURE LENGTH

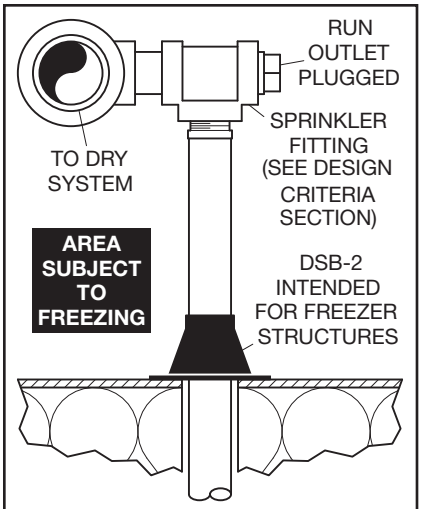


FIGURE 12
SPRINKLER FITTING
UNHEATED AREA

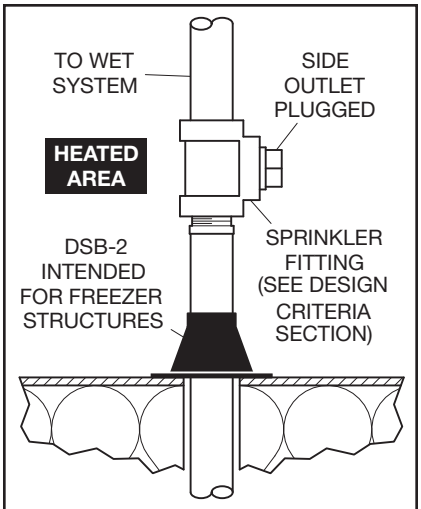


FIGURE 13
SPRINKLER FITTING
HEATED AREA

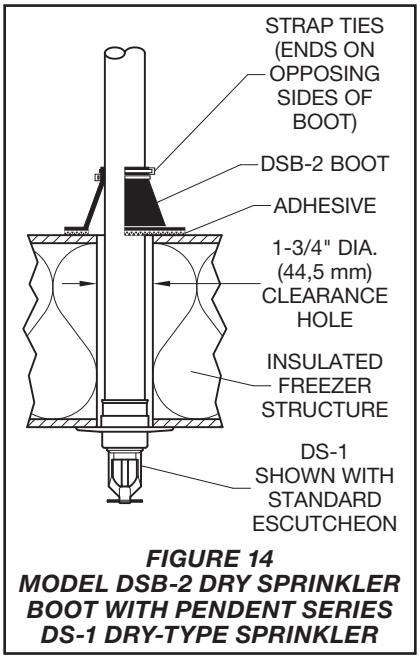


FIGURE 14
MODEL DSB-2 DRY SPRINKLER BOOT WITH PENDENT SERIES DS-1 DRY-TYPE SPRINKLER

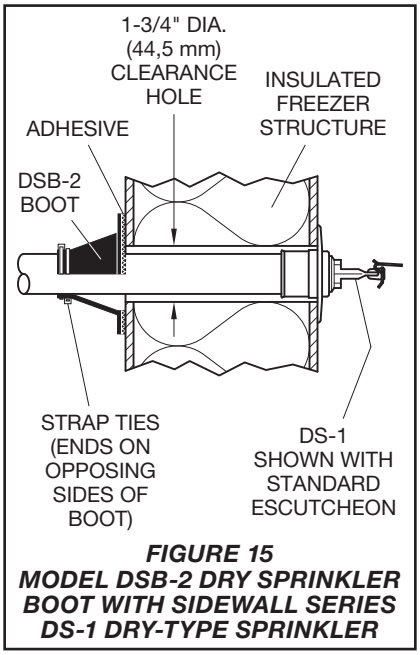


FIGURE 15
MODEL DSB-2 DRY SPRINKLER BOOT WITH SIDEWALL SERIES DS-1 DRY-TYPE SPRINKLER

Installation

TYCO Series DS-1 5.6K Pendent, Upright, and Horizontal Sidewall, Standard Response, Standard Coverage Dry-type Sprinklers must be installed in accordance with this section.

General Instructions
Series DS-1 Dry-type Sprinklers must only be installed in fittings that meet the requirements of the Design Criteria section. Refer to the Design Criteria section for other important requirements regarding piping design and sealing of the clearance space around the Sprinkler Casing.

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 1/16 inch (1,6 mm) for the 135°F (57°C) rating to 1/8 inch (3,2 mm) for the 360°F (182°C) rating.

Obtain a leak-tight 1 inch NPT sprinkler joint by applying a minimum-to-maximum torque of 20 to 30 lbs.-ft. (26,8 to 40,2 Nm). 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. Re-adjust the position of the sprinkler fitting to suit.

Notes:
- *Install pendent sprinklers only in the pendent position; install upright sprinklers only in the upright position. The deflector of a pendent or upright sprinkler is to be parallel to the ceiling.*
- *Install horizontal sidewall sprinklers in the horizontal position with their centerline of waterway perpendicular to the back wall and parallel to the ceiling. Ensure the word "TOP" on the Deflector faces the ceiling.*

Step 1. With a non-hardening pipe-thread sealant such as TEFLON applied to the inlet threads, hand-tighten the sprinkler into the sprinkler fitting.

Step 2. Wrench-tighten the sprinkler using either:

- a pipe wrench on the Inlet Band or the Casing (Ref. Figure 1)
- the W-Type 7 Sprinkler Wrench on the Wrench Flat (Ref. Figure 2)

Apply the wrench recess of the W-Type 7 Sprinkler Wrench to the wrench flat.

Note: *If sprinkler removal becomes necessary, remove the sprinkler using the same wrenching method noted above. Sprinkler removal is easier when a non-hardening sealant was used and torque guidelines were followed. After removal, inspect the sprinkler for damage.*

Step 3. After installing the ceiling or wall and applying a ceiling finish, slide on the outer piece of the escutcheon until it comes in contact with the ceiling/wall. Do not lift the ceiling panel out of its normal position.

When using the Deep Escutcheon, hold the outer piece in contact with the mounting surface (ceiling or wall). Then rotate the inner piece approximately 1/4 turn with respect to the outer piece, to hold the Deep Escutcheon firmly together.

Care and Maintenance

TYCO Series DS-1 5.6K Pendent, Upright, and Horizontal Sidewall, Standard Response, Standard Coverage Dry-type 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, obtain permission to shut down the affected fire protection systems from the proper authorities and notify all personnel who may be affected by this action.

Absence of the outer piece of an escutcheon, which is used to cover a clearance hole, may delay the time to sprinkler operation in a fire situation.

A Vent Hole is provided in the Bulb Seat (Ref. Figure 1) to indicate if the Dry Sprinkler is remaining dry. Evidence of leakage from the Vent Hole indicates potential leakage past the Inlet seal and the need to remove the sprinkler to determine the cause of leakage; for example, an improper installation or an ice plug. Close the fire protection system control valve and drain the system before removing the sprinkler.

Sprinklers which 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 National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any other 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.

P/N* 60 – XXX – X – XXX

		SIN
96	Pendent with Standard Escutcheon (1" NPT)	TY3255 (Figure 3)
93	Pendent with Deep Escutcheon (1" NPT)	TY3255 (Figure 5)
97	Pendent with Recessed Escutcheon (1" NPT)	TY3255 (Figure 4)
92	Pendent without Escutcheon (1" NPT)	TY3255 (Figure 6)
94	Sidewall with Standard Escutcheon (1" NPT)	TY3355 (Figure 8)
53	Sidewall with Deep Escutcheon (1" NPT)	TY3355 (Figure 9)
54	Sidewall without Escutcheon (1" NPT)	TY3355 (Figure 10)
98	Upright without Escutcheon (1" NPT)	TY3155 (Figure 7)

	SPRINKLER FINISH	ESCUTCHEON FINISH(1)
0	CHROME PLATED	SIGNAL WHITE (RAL9003) POLYESTER
1	NATURAL BRASS	SIGNAL WHITE (RAL9003) POLYESTER
2	NATURAL BRASS	BRASS PLATED
4	SIGNAL WHITE (RAL9003) POLYESTER	SIGNAL WHITE (RAL9003) POLYESTER
9	CHROME PLATED	CHROME PLATED

	TEMPERATURE RATING(2)
0	135°F (57°C)
1	155°F (68°C)
2	175°F (79°C)
3	200°F (93°C)
4	286°F (141°C)
5	360°F (182°C)

	ORDER LENGTH(3)
055	5.50"
082	8.25"
180	18.00"
187	18.75"
372	37.25"
480	48.00"

Notes:
1. Escutcheon Finish applies to sprinklers provided with escutcheons.
2. 360°F (182°C) temperature rating applies to non-recessed sprinkler assemblies.
3. Dry-type Sprinklers are furnished based upon "Order Length" as measured per Figures 3 through 10, as applicable, and for each individual sprinkler where it is to be installed. After the measurement is taken, round it to the nearest 1/4 inch increment.

* Use Prefix "I" for ISO 7-R 1 Connection (e.g., I-60-961-1-180).

TABLE D
SERIES DS-1 DRY-TYPE SPRINKLERS, 5.6K, STANDARD RESPONSE
PART NUMBER SELECTION

Limited Warranty

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

Contact your local distributor for availability. When placing an order, indicate the full product name, including description and part number (P/N).

Dry-type Sprinklers
When ordering Series DS-1 5.6K Pendent, Upright, and Horizontal Sidewall, Standard Response, Standard Coverage Dry-type Sprinklers, specify the following information:

- SIN:
  TY3255 – Pendent
  TY3155 – Upright
  TY3355 – Horizontal Sidewall
- Order Length:
  Dry-type Sprinklers are furnished based upon Order Length as measured per Figures 3 through 10, as applicable. After the measurement is taken, round it to the nearest 1/4 inch increment.
- Inlet Connections:
  1 Inch NPT
  (Standard)

  ISO 7-R 1
  (For information on ISO Inlet Thread Connections, contact your Tyco Sales Representative.)
- Temperature Rating
- Sprinkler Finish
- Escutcheon Type and Finish, as applicable
- P/N from Table D
  Part numbers are for 1 inch NPT standard order sprinklers. Orders for all other sprinkler assemblies must be accompanied by a complete description.

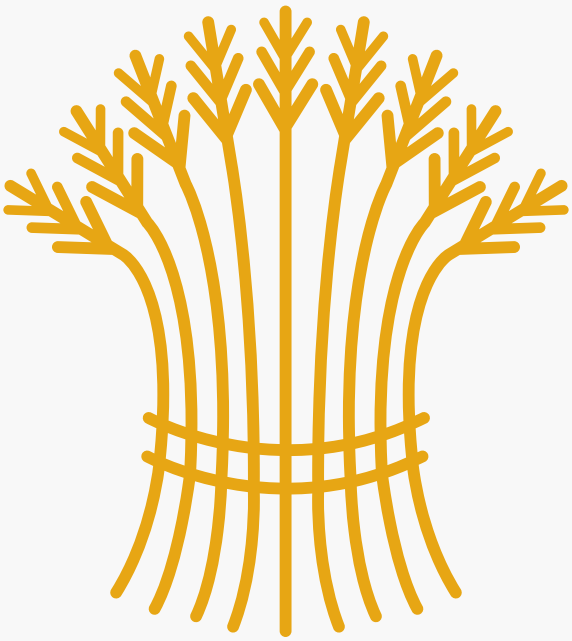
Sprinkler Wrench
Specify W-Type 7 Sprinkler Wrench, P/N 56-850-4-001

Sprinkler Boot
Specify Model DSB-2 Dry Sprinkler Boot, P/N 63-000-0-002

This part number includes one (1) Boot, two (2) Strap Ties, and 1/3 oz. of Adhesive (a sufficient quantity for installing one boot).

GLOBAL HEADQUARTERS | 1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700

tyco Fire Protection Products



Steel Fire Sprinkler Pipe

Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES

Wheatland Tube
Fire Sprinkler Products

Wheatland Tube began producing steel fire sprinkler pipe in 1931, and today offers the most complete line of products in the industry. Engineers and contractors across the continent depend on us for steel fire sprinkler pipe and a number of proprietary products — always in stock and ready to deliver.

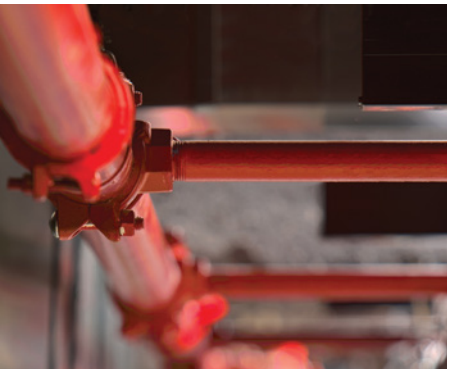
100% Compatibility
We guarantee our steel pipe is 100% compatible with fire protection systems that use only steel pipe. Why risk incompatibility? Wheatland's complete line of steel sprinkler pipe makes design easy and brings you peace of mind.*

Accurate and Efficient
Our products help you work safer and smarter — not harder. With our extensive in-house capabilities, we offer the shortest production cycle times in the industry, and we deliver to you accurately and on time, every time.

Green and Sustainable
Our steel fire sprinkler pipe contains recycled steel and provides decades of reliable service. At the end of its life, the steel may be almost fully recycled, supporting your green policies.

Zekelman Industries
Wheatland Tube is a division of Zekelman Industries, the largest independent manufacturer of steel hollow structural sections (HSS) and steel pipe in North America. We leverage our 100-plus years of pipe and tube manufacturing experience and expertise to produce 2 million tons of pipe and tube annually. Backed by Zekelman Industries, you can count on Wheatland for **strength, innovation and service** — bringing exceptional value to your business.

**Wheatland Tube has never warranted compatibility between its steel pipe products and CPVC products.*



High quality, high performance

Wheatland's Schedule 10 and Schedule 40 steel fire sprinkler pipe are subjected to the toughest possible testing to ensure the highest possible quality — not to mention reliable, long-lasting performance.

Proprietary mill coating ensures clean, corrosion-resistant surface

Outperforms and outlasts standard lacquer-coated pipe

Easily painted, without special preparation

Available with hot-dip galvanizing

Also available in black

TECHNICAL DATA

NPS	NOM ID	WT./FT. (LBS.)	WT./FT. H_2O FILLED	PCS./LIFT	WT./LIFT 21'	WT./ LIFT 24'	WT./LIFT 25'
1¼	1.442	1.807	2.514	61	2315	2645	2756
1½	1.682	2.087	3.049	61	2673	3055	3183
2	2.157	2.640	4.222	37	2051	2344	2442
2½	2.635	3.534	5.895	30	2226	2544	2651
3	3.260	4.336	7.949	19	1730	1977	2060
4	4.260	5.619	11.789	19	2242	2562	2669
5	5.295	7.780	17.309	13	2124	2427	2529
6	6.357	9.298	23.038	10	1953	2232	2325
8	8.249	16.960	40.086	7	2493	2849	2968

SCHEDULE 10 SPECIFICATIONS

NPS	NOM OD		NOM ID		NOMINAL WALL		NOMINAL WEIGHT		UL	PIECES
	in.	mm	in.	mm	in.	mm	lbs./ft.	kg/m	CRR*	Lift
1¼	1.660	42.2	1.442	36.6	0.109	2.77	1.81	2.69	7.3	61
1½	1.900	48.3	1.682	42.7	0.109	2.77	2.09	3.11	5.8	61
2	2.375	60.3	2.157	54.8	0.109	2.77	2.64	3.93	4.7	37
2½	2.875	73.0	2.635	66.9	0.120	3.05	3.53	5.26	3.5	30
3	3.500	88.9	3.260	82.8	0.120	3.05	4.34	6.46	2.6	19
4	4.500	114.3	4.260	108.2	0.120	3.05	5.62	8.37	1.6	19
5	5.563	141.3	5.295	134.5	0.134	3.40	7.78	11.58	1.5	13
6	6.625	168.3	6.357	161.5	0.134	3.40	9.30	13.85	1.0	10
8	8.625	219.1	8.249	209.5	0.188	4.78	16.96	25.26	2.1	7

** Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).*

WEIGHTS AND DIMENSIONS

NOMINAL SIZE	OD	SCHEDULE 40		
	in.	Wall Inches	Wt. lbs./ft.	Wt./Ft. H_2O Filled
1	1.315	0.133	1.68	2.055
1¼	1.660	0.140	2.27	2.922
1½	1.900	0.145	2.72	3.602
2	2.375	0.154	3.66	5.109
2½	2.875	0.203	5.80	7.871
3	3.500	0.216	7.58	10.783
3½	4.000	0.226	9.12	—
4	4.500	0.237	10.80	16.311
5	5.563	0.258	14.63	23.262
6	6.625	0.280	18.99	31.498

SCHEDULE 40 SPECIFICATIONS

NPS	NOM OD		NOM ID		NOMINAL WALL		NOMINAL WEIGHT		UL	PIECES
	in.	mm	in.	mm	in.	mm	lbs./ft.	kg/m	CRR*	Lift
1	1.315	33.4	1.049	26.6	0.133	3.38	1.68	2.50	1.00	70
1¼	1.660	42.2	1.380	35.1	0.140	3.56	2.27	3.39	1.00	51
1½	1.900	48.3	1.610	40.9	0.145	3.68	2.72	4.05	1.00	44
2	2.375	60.3	2.067	52.5	0.154	3.91	3.66	5.45	1.00	30

** Calculated using Standard UL CRR formula, UL Fire Protection Directory, Category VIZY. The CRR is a ratio value used to measure the ability of a pipe to withstand corrosion. Threaded Schedule 40 steel pipe is used as the benchmark (value of 1.0).*

Schedule 10 and Schedule 40 Meet or Exceed These Standards:

- ASTM A135, Type E, Grade A (Schedule 10)
- ASTM A795, Type E, Grade A (Schedule 40)
- UL and C-UL Listed
- FM Approved
- NFPA 13

Wheatland Tube
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About Wheatland Tube

Wheatland Tube, a division of Zekelman Industries, produces a wide range of steel tubular products, including standard steel pipe, galvanized mechanical tubing, fence framework, fire sprinkler pipe, electrical conduit, elbows, couplings and nipples.

For more information, contact Wheatland Tube at:
800.257.8182 or **info@wheatland.com**
Or, visit our website at wheatland.com

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WFS-031518

Victaulic® VicFlex™ Sprinkler Fittings
Series AH2 and AH2-CC Braided Flexible Hoses

10.85

Series AH2

Series AH2-CC

1.0 PRODUCT DESCRIPTION

Available Sizes by Component

- **Series AH2 1"/DN25 Nominal ID Braided Hose:** 31, 36, 48, 60, 72"/790, 915, 1220, 1525, 1830 mm.
  Note: length includes adapter nipple and 5.75"/140 mm straight reducer.
- **Series AH2-CC 1"/DN25 Nominal ID Braided Hose:** 31, 36, 48, 60, 72"/790, 915, 1220, 1525, 1830 mm.
  Note: length includes captured coupling and 5.75"/140 mm straight reducer.
- **Sprinkler Reducers:**
  - **Sprinkler Connections:** ½ and ¾"/15 and 20 mm
  - **Straight Lengths:** 5.75, 9, 13"/140, 230, 330 mm
  - **90° Elbows:**
    - Short (typically used with concealed sprinklers)
    - Long (typically used with recessed pendent sprinklers)
    - Low Profile Short (for use with Style AB5, AB11, AB12, ABBA and ABMM Bracket)
    - Low Profile Long (for use with Style AB5, AB11, AB12, ABBA and ABMM Bracket)
- **Inlet Connections:**
  - 1"/25 mm Grooved IGS
  - 1"/25 mm NPT or BSPT adapter nipples for attaching to pipe and fittings outlined in NFPA standards.
  - ¾"/20 mm NPT or BSPT adapter nipples available for VdS.
  - 1 ¼"/ 32 mm BSPT adapter nipples available for LPCB.

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

1.0 PRODUCT DESCRIPTION (Continued)

- **Brackets:**
  - Style AB1 for suspended and hard-lid ceilings and sidewalls, allows installation before most ceiling tiles in place
  - Style AB2 for suspended and hard-lid ceilings and sidewalls, allows for vertical sprinkler adjustment, and installation before most ceiling tiles in place
  - Style AB3 for surface mount applications, wood, metal and block walls, or ceilings
  - Style AB4 for hard-lid ceilings with hat furring channel grid systems, allows for vertical sprinkler adjustment
  - Style AB5 for hard-lid ceilings and sidewalls, allows for vertical sprinkler adjustment
  - Style AB7 for suspended and hard-lid ceilings
  - Style AB7 Adjustable for suspended and hard-lid ceilings
  - Style AB8 for hard-lid ceilings with CD 60/27 profile metal studs (regionally available)
  - Style AB9 for hard-lid ceilings with hat furring channel grid systems
  - Style AB10 for Armstrong® TechZone™ ceilings
  - Style AB11 for lay-in panel suspended t-grid ceilings or drywall suspended t-grid ceilings, allows for low profile installations (use only with 90° low profile elbows)
  - Style AB12 for suspended and hard-lid ceilings, allows for vertical sprinkler adjustment, and allows for low profile installation down to 4"/100mm.
  - Style ABBA bracket for suspended, exposed, and hard-lid ceilings
  - Style ABMM bracket for surface mount and stand off-mount applications, wood, metal and block walls, or ceilings and hard-lid ceilings

Maximum Working Temperature

- 225°F/107°C

Maximum Working Pressure

- 200 psi/1375 kPa (FM Approval)
- 175 psi/1206 kPa (cULus Listed)
- 1600 kPa/232 psi (VdS/LPCB Approved)
- 1.4 MPa (CCCf Approved)

Connections

- To adapter nipple (inlet) via
  - 1"/25.4 mm Grooved IGS
  - 1"/25.4 mm NPT or BSPT male thread
  - ¾"/20 mm BSPT male thread (VdS only)
  - 1 ¼"/32 mm BSPT male thread (LPCB only)
- To sprinkler head (outlet) via ½" or ¾"/15 mm or 20 mm

Minimum Bend Radius

- 7"/178 mm (FM/CCCf Approval)
- 2"/51 mm (cULus Listed)
- 3"/76.2 mm (VdS/LPCB Approved)

Maximum Allowable Sprinkler K-Factors

- FM (½"/15 mm reducer) K5.6/8,1 (S.I.), (¾"/20 mm reducer) K14.0/20,2 (S.I.)
- cULus (½"/15 mm reducer) K8.0/11,5 (S.I.), (¾"/20 mm reducer) K14.0/20,2 (S.I.)
- VdS/LPCB (½"/15 mm reducer) K5.6/8,1 (S.I.), (¾"/20 mm reducer) K8.0/11,5 (S.I.)

2.0 CERTIFICATION/LISTINGS

NOTE

- The *VicFlex* Series AH2 Hose has been tested and evaluated by Spears® for acceptable use with Spears® CPVC Products and is therefore covered under the Spears® FlameGaurd® Installer Protection Plan.

3.0 SPECIFICATIONS – MATERIAL

Series AH2

- **Flexible Hose:** 300-series Stainless Steel
- **Collar/Weld Fitting:** 300-series Stainless Steel
- **Gasket Seal:** Victaulic EPDM
- **Isolation Ring:** Nylon
- **Nut and Nipple:** Carbon Steel, Zinc Plated
- **Reducer (½"/15 mm or ¾"/20 mm):** Carbon Steel, Zinc-Plated
- **Low Profile Elbows:** Ductile Iron, Zinc-Plated

Brackets: Carbon Steel, Zinc-Plated

Series AH2-CC

- **Flexible Hose:** 300-series Stainless Steel
- **Collar/Weld Fitting:** 300-series Stainless Steel
- **Gasket Seal:** Victaulic EPDM
- **Isolation Ring:** Nylon
- **Coupling Retainer Ring:** Polyethelene
- **Nut and Nipple:** Carbon Steel, Zinc Plated
- **Reducer (½"/15 mm or ¾"/20 mm):** Carbon Steel, Zinc-Plated
- **Housing:** Ductile iron conforming to ASTM A 536, Grade 65-45-12. Ductile iron conforming to ASTM A 395, Grade 65-45-15, is available upon special request.

  Coupling Housing Coating:

  - Orange enamel (North America, Asia Pacific).
  - Red enamel (Europe).
  - Hot dipped galvanized.

  Gasket:[1]

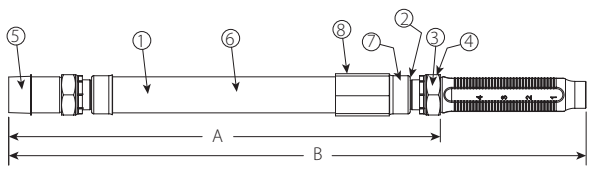
  - **Grade "E" EPDM (Type A)**
    FireLock EZ products have been Listed by Underwriters Laboratories Inc., Underwriters Laboratories of Canada Limited, and Approved by Factory Mutual Research for wet and dry (oil free air) sprinkler services within the rated working pressure.

  [1] Services listed are General Service Guidelines only. It should be noted that there are services for which these gaskets are not compatible. Reference should always be made to the latest Victaulic Gasket Selection Guide for specific gasket service guidelines and for a listing of services which are not compatible.

- **Bolts/Nut:** Zinc electroplated carbon steel, trackhead meeting the physical and chemical requirements of ASTM A 449 and physical requirements of ASTM A 183.
- **Linkage:** CrMo Alloy Steel zinc electroplated per ASTM B633 Zn/Fe 5, Type III Finish

4.0 DIMENSIONS

Product Details - Series AH2 Braided Hose

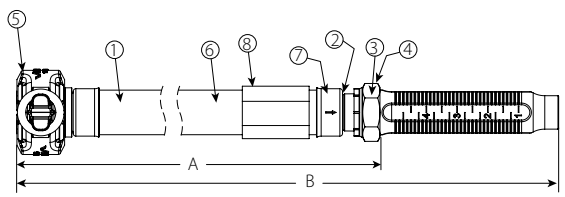


Item	Description
1	Flexible Hose
2	Isolation Ring
3	Gasket
4	Nut
5	Adapter Nipple
6	Braid
7	Collar/Weld Fitting
8	Sleeve

Hose Length Dimensions

Hose Length inches mm	A inches mm	B inches mm
31/790	25.3/641	31/790
36/915	31.3/794	36/915
48/1219	42.3/1073	48/1220
60/1525	54.3/1378	60/1525
72/1830	66.3/1683	72/1830

Series AH2-CC Braided Hose



Item	Description
1	Flexible Hose
2	Isolation Ring
3	Gasket
4	Nut
5	Captured Coupling
6	Braid
7	Collar/Weld Fitting
8	Sleeve

Hose Length inches mm	A inches mm	B inches mm
31/790	24.5/622	29.8/757
36/915	29.5/749	34.8/884
48/1219	41.5/1054	46.8/1189
60/1525	53.5/1359	58.8/1494
72/1830	65.5/1664	70.8/1798

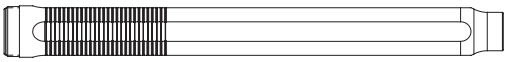
4.0 DIMENSIONS (Continued)

Standard Reducer

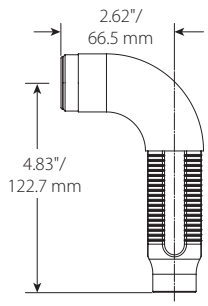
5.75"/140 mm straight reducer

Optional Reducers

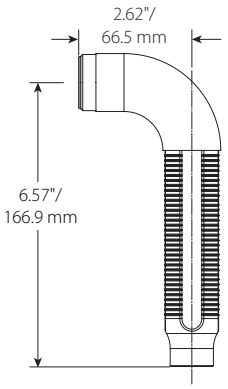
9.0"/229 mm straight reducer



13.0"/330 mm straight reducer



Short 90° elbow reducer

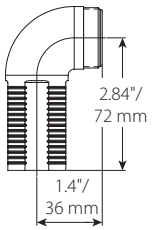


Long 90° elbow reducer

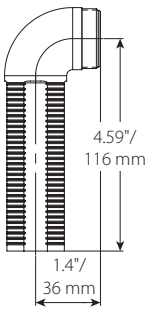
NOTE

- The Short 90° elbow reducer is typically used with concealed sprinklers while the longer 90 elbow is typically used in the installation of recessed pendent sprinklers.
- FM/VdS Approved only.

Low Profile



Short 90° elbow reducer



Long 90° elbow reducer

NOTE

- Style AB11: When low profiles elbows are used with the Style AB11 bracket, the Low Profile Short Elbow is typically used with concealed sprinklers while the Low Profile Long Elbow is typically used in the installation of recessed pendent sprinklers.

4.1 DIMENSIONS

VicFlex Brackets

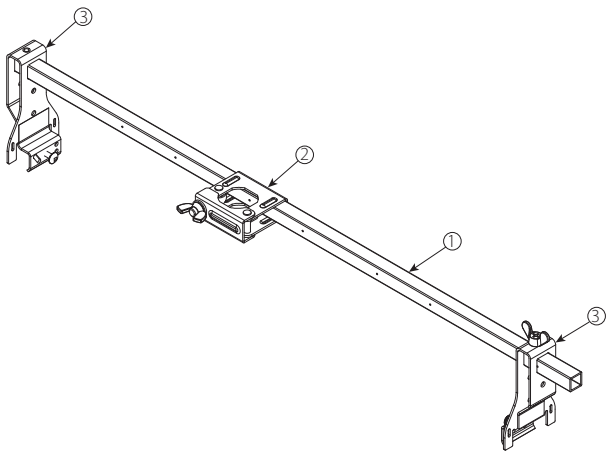
Style AB1

- Suspended Ceilings
- Hard-Lid Ceilings (FM Only)

Item	Description
1	24"/610 mm or 48"/1219 mm Square Bar
2	Patented Center Bracket
3	End Bracket

NOTE

- Both sizes FM/VdS/LPCB Approved, cULus listed



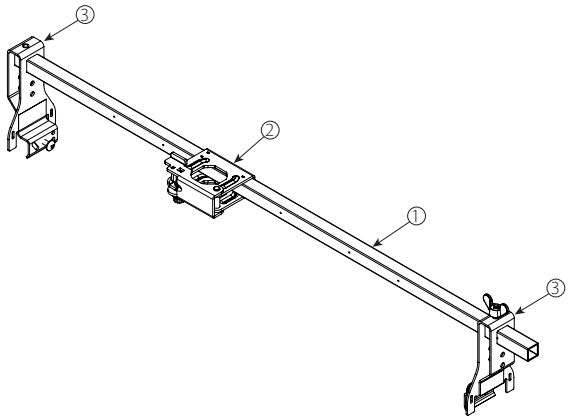
Style AB2

- Suspended Ceilings
- Hard-Lid Ceilings

Item	Description
1	24"/610 mm or 48"/1219 mm Square Bar
2	Patented Vertically Adjustable Center Bracket
3	End Bracket

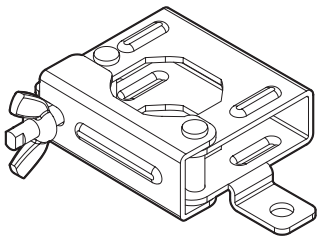
NOTE

- Both sizes FM/VdS/LPCB Approved, cULus listed



Style AB3

- Surface Mount Applications
- FM/LPCB Approved



4.2 DIMENSIONS

VicFlex Brackets

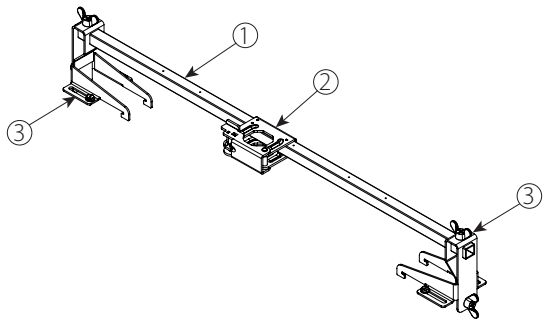
Style AB4

- Hard-Lid Ceilings with Hat furring channel grid system

Item	Description
1	24"/610 mm or 48"/1219 mm Square Bar
2	Patented Vertically Adjustable Center Bracket
3	End Bracket for Hat Furring Channel

NOTE

- Both sizes FM/VdS/LPCB Approved, cULus listed.



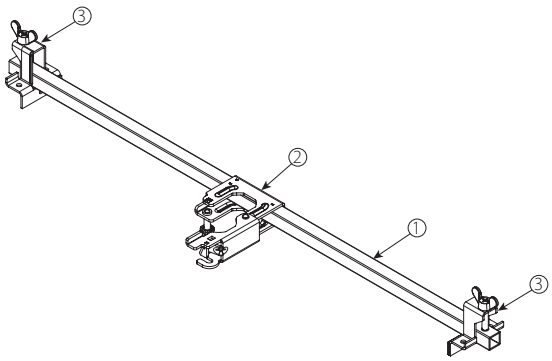
Style AB5

- Hard-Lid Ceilings

Item	Description
1	24"/610 mm or 48"/1219 mm Square Bar
2	Patented Vertically Adjustable Center Bracket
3	End Bracket

NOTE

- Both sizes FM/VdS/LPCB Approved, cULus listed.



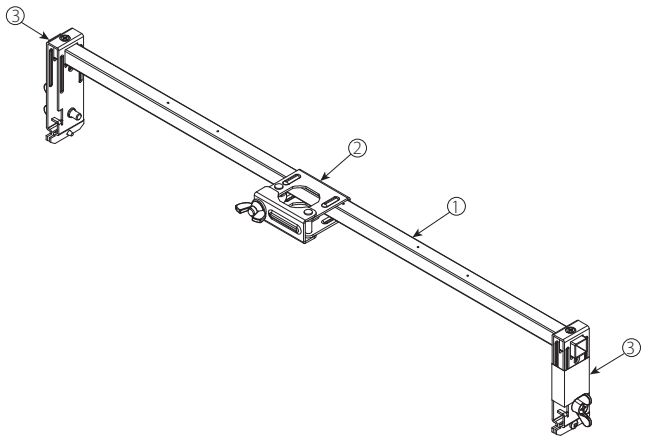
Style AB7

- Suspended Ceilings
- Hard-Lid Ceilings

Item	Description
1	24"/610 mm or 48"/1219 mm Square Bar
2	Patented 1-Bee2® Center Bracket
3	End Bracket

NOTE

- Both sizes FM/VdS/LPCB Approved.



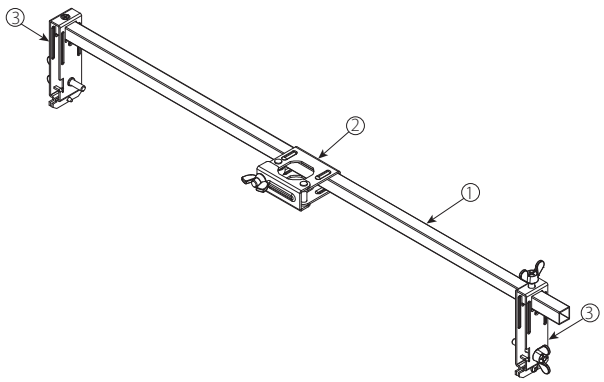
Style AB7 Adjustable

- Suspended Ceilings
- Hard-Lid Ceilings

Item	Description
1	700 mm or 1400 mm Square Bar
2	Patented 1-Bee2® Center Bracket
3	End Bracket (adjustable)

NOTE

- Both sizes FM/VdS/LPCB Approved.



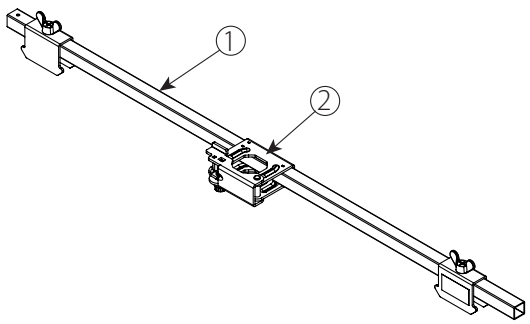
4.3 DIMENSIONS

VicFlex Brackets

Style AB8

- Hard-Lid Ceilings

Item	Description
1	700 mm or 1400 mm Square Bar
2	Patented Vertically Adjustable Center Bracket
3	End Bracket



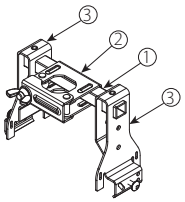
NOTE

- Both sizes FM/VdS/LPCB Approved.

Style AB10

- Suspended ceilings
- Armstrong® TechZone™

Item	Description
1	6"/152 mm Square Bar
2	Patented 1-Bee2® Center Bracket
3	End Bracket



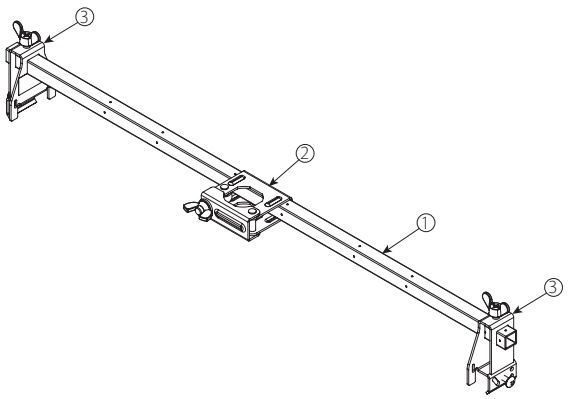
NOTE

- FM/VdS/LPCB Approved, cULus listed.

Style AB11

- Suspended ceilings
- Hard-Lid ceilings

Item	Description
1	24"/610 mm or 48"/1219 mm Square Bar
2	Patented 1-Bee2® Center Bracket
3	End Bracket



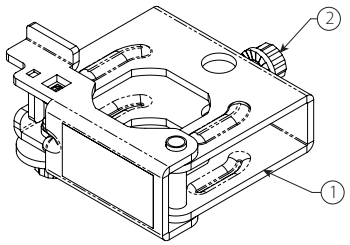
NOTE

- FM/VdS Approved, cULus listed.

Style AB12

- Suspended ceilings
- Hard-Lid ceilings

Item	Description
1	Style AB12 Bracket Body
2	#2 Square Drive Set Screw



NOTE

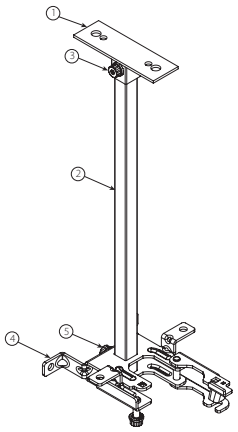
- FM/VdS Approved.

4.3 DIMENSIONS (CONTINUED)

VicFlex Brackets

Style ABBA

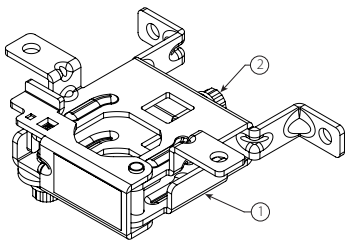
- Floor-above mount
- Cantilever mount
- Temporary mount in exposed ceilings



Item	Description
1	Style ABBA Mounting Plate
2	Style ABBA Square Bar
3	Cap Screw, Serated Flange, M6 x 1 x 20, T25 Torx Drive Recessed
4	Style ABMM Bracket Body
5	Cap Screw, Serated Flange, M6 x 1 x 15.24, T25 Torx Drive Recessed

Style ABMM

- Surface mount
- Stand-off mount

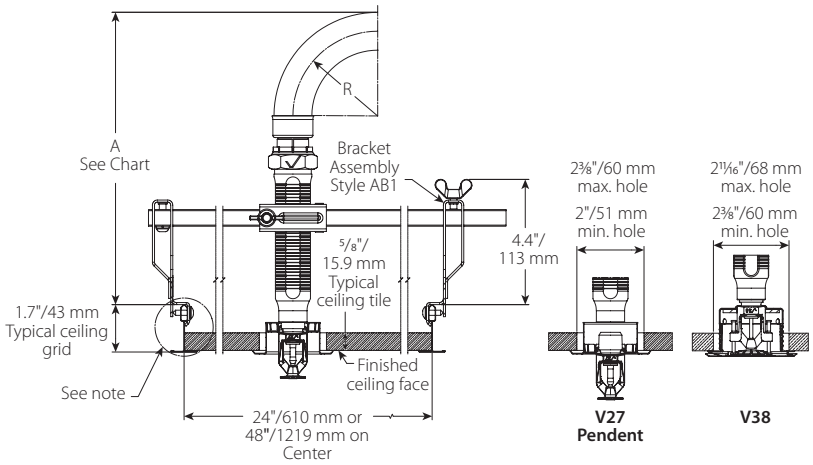


Item	Description
1	Style ABMM Bracket Body
2	Cap Screw, Serated Flange, M6 x 1 x 15.24, T25 Torx Drive Recessed

4.4 DIMENSIONS

Clearances

Series AH2 Braided Hose and Style AB1 Bracket



Hose Clearance Chart								
	Straight Reducer						Long Elbow	Short Elbow
	V2707 ¾" Max Recess inches mm	V3802 ½" Max Recess inches mm	V2707 ¾" Max Recess inches mm	V3802 ½" Max Recess inches mm	V2707 ¾" Max Recess inches mm	V3802 ½" Max Recess inches mm	V2707 ¾" Max Recess inches mm	V3802 ½" Max Recess inches mm
"R" Minimum Bend Radius	2.0 50		3.0 80		7.0 175		–	
"A" Minimum Required Installation Space	8.6 218	10.1 269	9.6 244	11.1 281	13.6 345	15.1 383	5.8 147	5.8 147

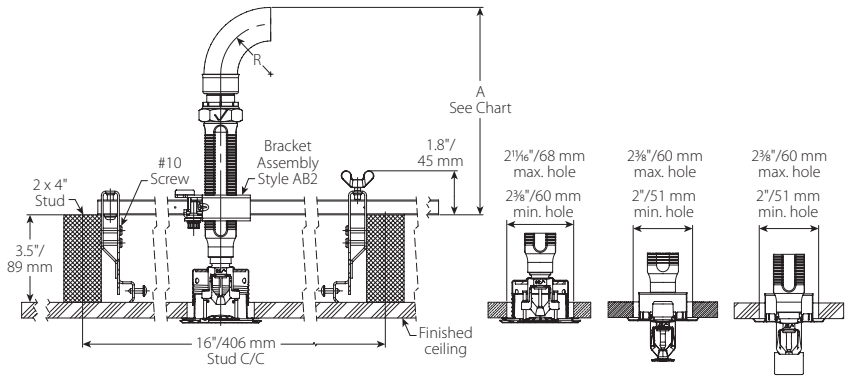
NOTE

- Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.

4.5 DIMENSIONS

Clearances

Series AH2 Braided Hose and Style AB2 Bracket



Hose Clearance Chart									
	Straight Reducer								
	V2707 ¾" I 20 mm Max Recess" inches mm	**V3802 ½" I 13 mm Max Recess** inches mm	**V2709 ¾" I 20 mm Sidewall** inches mm	**V2707 ¾" I 20 mm Max Recess** inches mm	**V3802 ½" I 13 mm Max Recess** inches mm	**V2709 ¾" I 20 mm Sidewall** inches mm	**V2707 ¾" I 20 mm Max Recess** inches mm	**V3802 ½" I 13 mm Max Recess** inches mm	**V2709 ¾" I 20 mm Sidewall** inches mm
"R" Minimum Bend Radius	2.0 50			3.0 80			7.0 175		
"A" Minimum Required Installation Space	6.2 158	7.6 193	6.1 155	7.2 183	8.6 218	7.1 180	11.2 285	12.6 320	11.1 282

Hose Clearance Chart			
	Long Elbow		Short Elbow
	V2707 ¾" I 20 mm Max Recess inches mm	**V2709 ¾" I 20 mm Sidewall** inches mm	**V3802 ½" I 13 mm Max Recess** inches mm
"R" Minimum Bend Radius	–		
"A" Minimum Required Installation Space	3.3 84	3.6 91	3.3 84

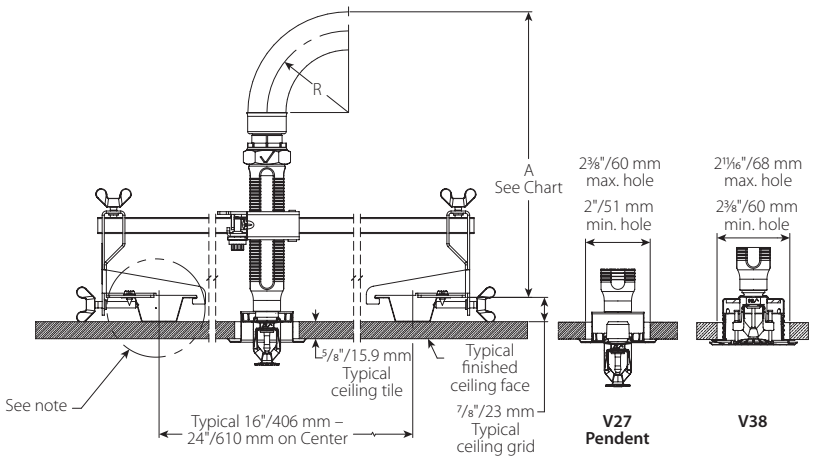
NOTE

- Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.

4.6 DIMENSIONS

Clearances

Series AH2 Braided Hose and Style AB4 Bracket



Hose Clearance Chart								
	Straight Reducer						Long Elbow	Short Elbow
	V2707 ¾" Max Recess inches mm	V3802 ½" Max Recess inches mm	V2707 ¾" Max Recess inches mm	V3802 ½" Max Recess inches mm	V2707 ¾" Max Recess inches mm	V3802 ½" Max Recess inches mm	V2707 ¾" Max Recess inches mm	V3802 ½" Max Recess inches mm
"R" Minimum Bend Radius	2.0 50	2.0 50	3.0 80	3.0 80	7.0 175	7.0 175	–	
"A" Minimum Required Installation Space	8.8 224	10.2 259	9.8 249	11.2 285	13.8 351	15.2 386	8.0 203	5.9 150

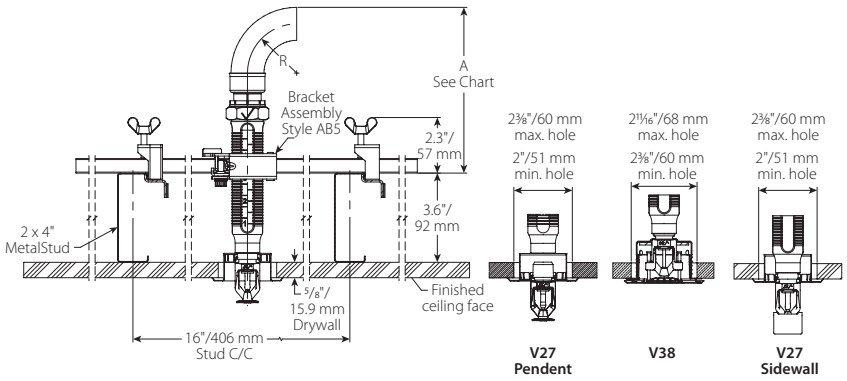
NOTE

Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.

4.7 DIMENSIONS

Clearances

Series AH2 Braided Hose and Style AB5 Bracket



Hose Clearance Chart									
	Straight Reducer								
	"V2707 ¾" I 20 mm Max Recess" inches mm	**V3802 ½" I 13 mm Max Recess** inches mm	**V2709 ¾" I 20 mm Sidewall** inches mm	**V2707 ¾" I 20 mm Max Recess** inches mm	**V3802 ½" I 13 mm Max Recess** inches mm	**V2709 ¾" I 20 mm Sidewall** inches mm	**V2707 ¾" I 20 mm Max Recess** inches mm	**V3802 ½" I 13 mm Max Recess** inches mm	**V2709 ¾" I 20 mm Sidewall** inches mm
"R" Minimum Bend Radius		2.0 50			3.0 80			7.0 175	
"A" Minimum Required Installation Space	6.0 158	7.7 196	6.1 155	7.0 178	8.7 221	7.1 180	11.0 279	12.7 323	11.1 282

Hose Clearance Chart					
	Long Elbow			Low-Profile Long Elbow	Short Elbow
	V2707 ¾" I 20 mm Max Recess inches mm	**V3802 ½" I 13 mm Max Recess** inches mm	**V2709 ¾" I 20 mm Sidewall** inches mm	**V3802 ½" I 13 mm Max Recess** inches mm	**V3802 ½" I 13 mm Max Recess** inches mm
"R" Minimum Bend Radius	–				
"A" Minimum Required Installation Space	3.5 89	4.9 124	3.6 91	2.9 74	3.3 84

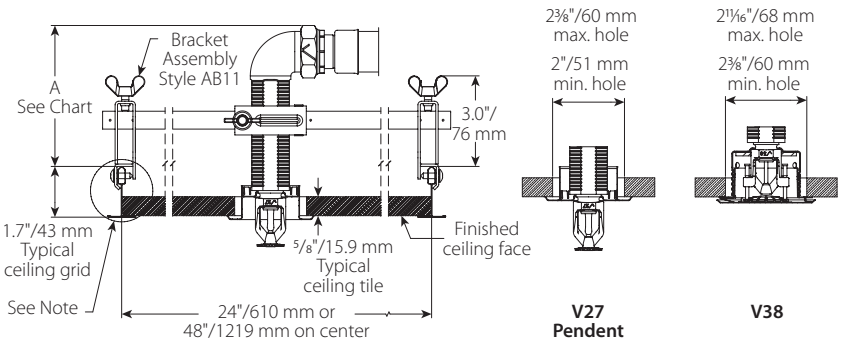
NOTE

- Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.

4.8 DIMENSIONS

Clearances

Series AH2 Braided Hose and Style AB11 Bracket (LOW PROFILE SOLUTION)



Hose Clearance Chart		
	Low-Profile Long Elbow	**Low-Profile Short Elbow**
	V2707 ¾" I 20 mm Max Recess" inches mm	**V3802 ½" I 13 mm Max Recess** inches mm
"A" Minimum Required Installation Space	4.0 102	3.9 99

NOTE

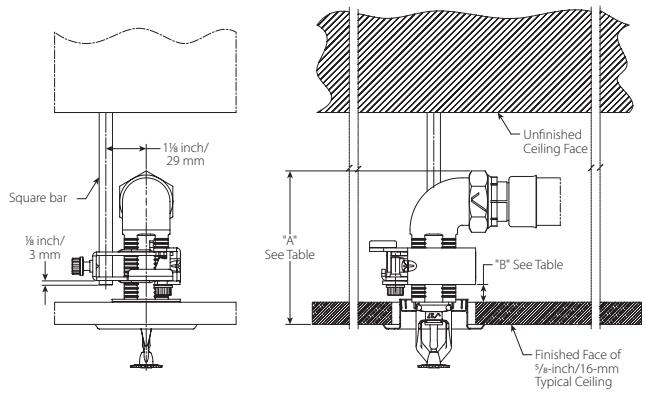
- Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.

4.9 DIMENSIONS

Clearances

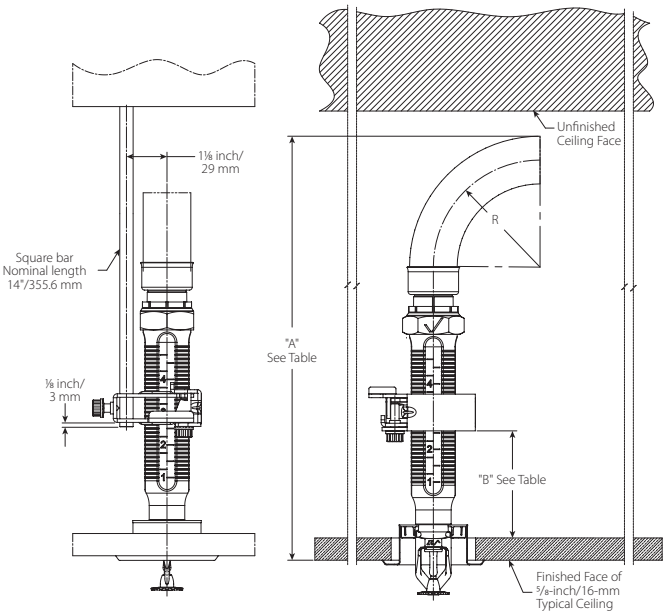
Style AB12 and ABBA Bracket

Suspended Ceiling Grid with Recessed Sprinkler with Low Profile Short Elbow



V2707 ½"/12.7 mm MAX. RECESS

Suspended Ceiling Grid with Recessed Sprinkler and Straight 5.75"/140 mm Reducer



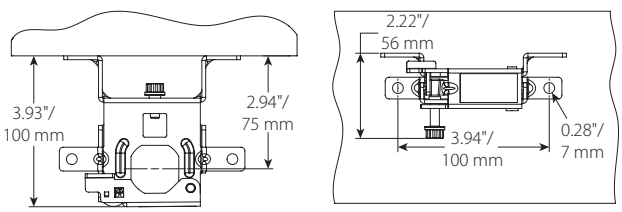
V2707 ¾"/19 mm MAX. RECESS

Dimension		Low Profile Short Elbow		Low Profile Long Elbow		Standard Short Elbow		Standard Long Elbow		Standard Straight Reducer	
		¾"/19 mm Recessed* inches mm	Concealed inches mm	¾"/19 mm Recessed inches mm	Concealed inches mm	¾"/19 mm Recessed inches mm	Concealed inches mm	¾"/19 mm Recessed inches mm	Concealed inches mm	¾"/19 mm Recessed inches mm	Concealed inches mm
A	Minimum Required Installation Space	4.0 101.6	5.5 139.7	5.6 142.2	7.2 182.9	5.9 149.9	7.5 190.5	7.7 195.6	9.3 236.2	15.0 381.0	16.6 421.6
B	Distance from Top of Typical Ceiling Tile to Bottom of Gate	0.5 12.7	2.0 50.8	1.5 38.1	1.5 38.1	1.5 38.1	1.5 38.1	3.0 76.2	3.0 76.2	3.0 76.2	3.0 76.2

* Adjustability will be limited

Style ABMM Bracket

Stand-off Dimensions

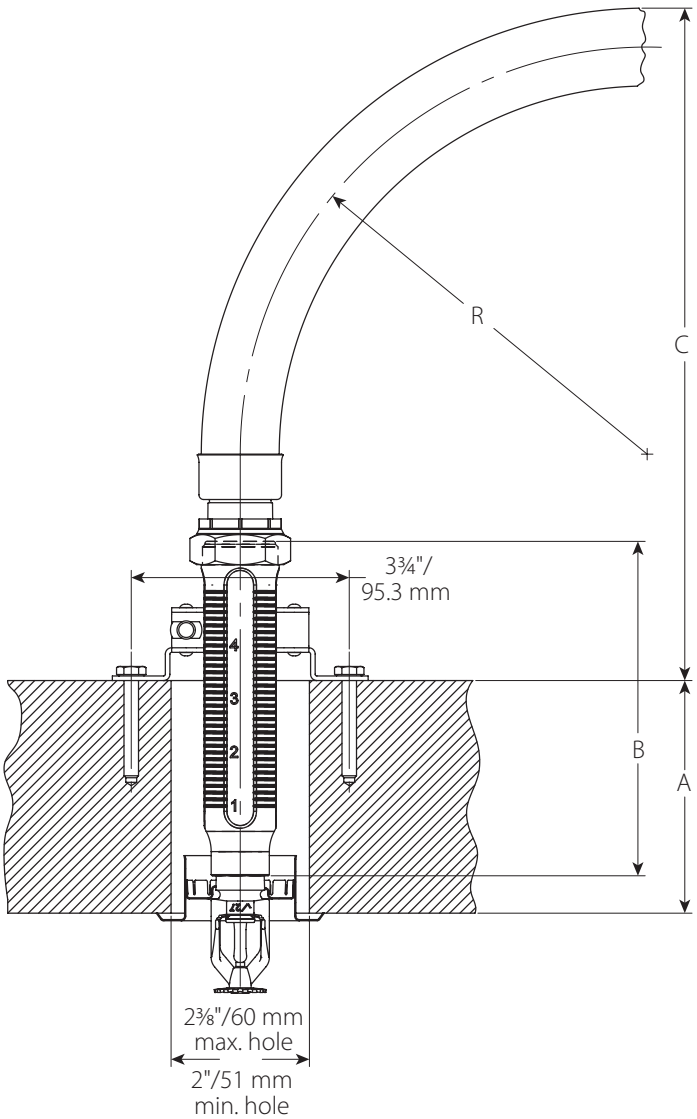


4.10 DIMENSIONS

Clearances

Style AB3 and ABMM Bracket

Surface Mount Application with Recessed Sprinkler



Hose Clearances																					
Dimension	inches mm			inches mm			inches mm		inches mm	inches mm	inches mm				inches mm			inches mm			inches mm	inches mm
Wall Thickness "A"	2 50			4 100			6 150		8 200	10 250	2 50				4 100			6 150			8 200	10 250
Outlet Length "B"	5.75 146.1	9 228.6	13 330.2	5.75 146.1	9 228.6	13 330.2	9 228.6	13 330.2	13 330.2	13 330.2	5.75 146.1	9 228.6	13 330.2	5.75 146.1	9 228.6	13 330.2	9 228.6	13 330.2	13 330.2	13 330.2
Hose Clearance "C"	11.6 294	14.8 376	18.8 478	9.6 243	12.8 325	16.8 427	10.8 275	14.8 376	12.8 325	10.8 275	12.6 319	15.8 402	19.8 503	10.6 268	13.8 351	17.8 452	11.8 300	15.8 402	13.8 351	11.8 300
Bend Radius "R"	7 175										8 200									

NOTE

- Variations of ceiling grids, sprinkler heads, brackets, and hoses are permitted but may result in clearance differences from the figures above.

5.0 PERFORMANCE – FRICTION LOSS DATA

Series AH2 and AH2-CC Braided Hoses with Straight 5.75"/140 mm Reducers Style AB1, AB2, AB4, AB5 and AB10 Brackets

inches/mm	inches/mm/type	Equivalent Length of 1"/33.7 mm Sch. 40 Pipe (C=120) feet/meters	Maximum Number of 90° Bends at 2"/51 mm Bend Radius
31/790	½"/15/Straight	16/4.9	4
	¾"/20/Straight	17/5.2	4
36/915	½"/15/Straight	21/6.4	5
	¾"/20/Straight	23/7.0	5
48/1220	½"/15/Straight	32/9.8	8
	¾"/20/Straight	37/11.3	8
60/1525	½"/15/Straight	46/14.0	10
	¾"/20/Straight	46/14.0	10
72/1830	½"/15/Straight	55/16.8	12
	¾"/20/Straight	53/16.2	12

Series AH2 and AH2-CC Braided Hose with 90° Low Profile Elbows Style AB11 *VicFlex* Bracket

inches/mm	inches/mm	Equivalent Length of 1"/33.7 mm Sch. 40 Pipe feet/meters	Maximum Number of 90° Bends at 2"/51 mm Bend Radius
31/790	½"/15	24/7.3	4
	¾"/20	24/7.3	4
36/915	½"/15	26/7.9	5
	¾"/20	28/8.5	5
48/1220	½"/15	43/13.1	8
	¾"/20	42/12.8	8
60/1525	½"/15	49/14.9	10
	¾"/20	50/15.2	10
72/1830	½"/15	65/19.8	12
	¾"/20	63/19.2	12

5.0 PERFORMANCE – FRICTION LOSS DATA (CONTINUED)

Series AH2 and AH2-CC Braided Hoses Equivalent Length Design Guide

Equivalent length values at various numbers of 90 degree bends at 2"/51 mm center line bend radius

Length of Stainless Steel Flexible Hose inches/ mm	Outlet Size inches/ mm	1 Bend feet/ meters	2 Bends feet/ meters	3 Bends feet/ meters	4 Bends feet/ meters	5 Bends feet/ meters	6 Bends feet/ meters	7 Bends feet/ meters	8 Bends feet/ meters	9 Bends feet/ meters	10 Bends feet/ meters	11 Bends feet/ meters	12 Bends feet/ meters
31/790	½"/15	8.5/2.6	11.0/3.4	13.0/4.0	16.0/4.9	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
	¾"/20	10.0/3.0	12.5/3.8	14.0/4.3	17.0/5.2	N.A	N.A	N.A	N.A	N.A	N.A	N.A	N.A
36/915	½"/15	13.5/4.1	16.0/4.9	18.0/5.5	19.0/5.8	21.0/6.4	N.A	N.A	N.A	N.A	N.A	N.A	N.A
	¾"/20	14.0/4.3	17.0/5.2	19.5/5.9	20.0/6.1	23.0/7.0	N.A	N.A	N.A	N.A	N.A	N.A	N.A
48/1220	½"/15	15.5/4.7	17.0/5.2	19.5/5.9	20.0/6.1	21.0/6.4	22.0/6.7	28.0/8.5	32.0/9.8	N.A	N.A	N.A	N.A
	¾"/20	17.0/5.2	19.0/5.8	21.5/6.6	24.5/7.5	26.0/7.9	27.0/8.2	30.0/9.1	37.0/11.3	N.A	N.A	N.A	N.A
60/1525	½"/15	21.5/6.6	24.0/7.3	27.0/8.2	28.5/8.7	30.0/9.1	31.0/9.4	37.0/11.3	42.0/12.8	44.0/13.4	46.0/14.0	N.A	N.A
	¾"/20	23.0/7.0	24.0/7.3	28.0/8.5	29.5/9.0	30.5/9.3	31.0/9.4	38.0/11.6	42.0/12.8	44.0/13.4	46.0/14.0	N.A	N.A
72/1830	½"/15	30.0/9.1	32.0/9.8	36.5/11.1	37.5/11.4	40.5/12.5	41.0/12.8	42.0/12.8	46.0/14.0	49.0/14.9	52.0/15.8	54.0/16.5	55.0/16.8
	¾"/20	32.0/9.8	32.5/9.9	35.0/10.7	35.5/10.8	40.0/12.3	40.5/12.3	41.0/12.5	46.0/14.0	50.0/15.2	51.0/15.5	52.0/15.8	53.0/16.2

NOTES:

- Values for use with 5.75"/140 mm straight reducers.

How to use this Design Guide:

- For some systems, it may be advantageous for the designer to calculate the system hydraulics using shorter equivalent lengths associated with fewer than the maximum allowable number of bends. In this case, the designer may select a design number of bends for the job and use the associated equivalent length from the design guide to determine the system hydraulics.
- It is possible that the actual installed condition of some of the flexible drops may have more bends than the designer selected. When this happens, the design guide may be used to find equivalent lengths based on the actual installed number of bends for particular sprinkler installations. The system hydraulics can be recalculated using actual equivalent lengths to verify the performance of the system.

5.1 PERFORMANCE – FRICTION LOSS DATA

Series AH2 and AH2-CC Braided Hoses
Style AB1, AB2, AB3, AB4, AB5, AB7, AB7 Adj., AB8, AB10, AB12, ABBA and ABMM *VicFlex* Brackets

Length of Stainless Steel Flexible Hose inches/mm	K-Factor Imperial/S.I.	Outlet Size inches/mm/type	Equivalent Length of 1"/33.7 mm Sch. 40 Pipe feet/meters	Maximum Number of 90° Bends at 7"/178 mm Bend Radius
31/790	5.6/8.1	½"/15/Straight	13.8/4.2	2
		½"/15/90° Elbow	23.5/7.1	
36/915	5.6/8.1	½"/15/Straight	16.6/5.1	2
		½"/15/90° Elbow	25.6/7.8	
48/1220	5.6/8.1	½"/15/Straight	23.4/7.1	3
		½"/15/90° Elbow	30.7/9.3	
60/1525	5.6/8.1	½"/15/Straight	30.2/9.2	4
		½"/15/90° Elbow	35.9/10.9	
72/1830	5.6/8.1	½"/15/Straight	37.0/11.3	4
		½"/15/90° Elbow	41.1/12.5	
31/790	8.0/11.5	¾"/20/Straight	16.8/5.1	2
		¾"/20/90° Elbow	16.8/5.1	
36/915	8.0/11.5	¾"/20/Straight	20/6.0	2
		¾"/20/90° Elbow	19.7/6.0	
48/1220	8.0/11.5	¾"/20/Straight	27.8/8.4	3
		¾"/20/90° Elbow	26.6/8.1	
60/1525	8.0/11.5	¾"/20/Straight	35.7/10.9	4
		¾"/20/90° Elbow	33.6/10.2	
72/1830	8.0/11.5	¾"/20/Straight	43.5/13.2	4
		¾"/20/90° Elbow	40.6/12.2	
31/790	11.2/16.1	¾"/20/Straight	16.5/5.0	2
		¾"/20/90° Elbow	17.8/5.4	
36/915	11.2/16.1	¾"/20/Straight	19.5/5.9	2
		¾"/20/90° Elbow	20.7/6.3	
48/1220	11.2/16.1	¾"/20/Straight	26.7/8.1	3
		¾"/20/90° Elbow	27.9/8.5	
60/1525	11.2/16.1	¾"/20/Straight	33.9/10.3	4
		¾"/20/90° Elbow	35/10.7	
72/1830	11.2/16.1	¾"/20/Straight	41.3/12.5	4
		¾"/20/90° Elbow	42.2/12.8	
31/790	14.0/20.2	¾"/20/Straight	14.9/4.5	2
		¾"/20/90° Elbow	15.5/4.72	
36/915	14.0/20.2	¾"/20/Straight	19.4/5.9	2
		¾"/20/90° Elbow	19.6/5.9	
48/1220	14.0/20.2	¾"/20/Straight	30.3/9.2	3
		¾"/20/90° Elbow	29.5/8.9	
60/1525	14.0/20.2	¾"/20/Straight	33.9/10.3	4
		¾"/20/90° Elbow	34.1/10.4	
72/1830	14.0/20.2	¾"/20/Straight	37.5/11.4	4
		¾"/20/90° Elbow	38.6/11.7	

FM NOTES:

- The Series AH2 hose has been tested and Approved by FM Global for use in wet, dry and preaction systems per NFPA 13, 13R, and 13D and FM data sheets 2-0, 2-5, and 2-8. FM 1637 standard for safety include, but are not limited to, pressure cycling, corrosion resistance, flow characterisitics, vibration resistance, leakage, mechanical and hydrostatic strength.
- EXAMPLE: A 48-inch hose installed with two 30° bends and two 90° bends is permitted and considered equivalent to the data in the table shown above. In this example, the total number of degrees is 240°, which is less than the allowable 270°.

5.2 PERFORMANCE – FRICTION LOSS DATA

Series AH2 Braided Hose with 90° Low Profile Elbows Style AB5, AB11, AB12, ABBA and ABMM *VicFlex* Bracket

Length of Stainless Steel Flexible Hose inches/mm	K-Factor Imperial/S.I.	Outlet Size inches/mm	Equivalent Length of 1"/33.7mm Sch. 40 Pipe feet/meters	Maximum Number of 90° Bends at 7"/178mm Bend Radius
31/790	5.6/8.1	½"/15	13.7/4.2	2
36/915	5.6/8.1	½"/15	17.0/5.2	2
48/1220	5.6/8.1	½"/15	25.0/7.6	3
60/1525	5.6/8.1	½"/15	33.0/10.1	4
72/1830	5.6/8.1	½"/15	41.1/12.5	4
31/790	8.0/11.5	¾"/20	13.6/4.14	2
36/915	8.0/11.5	¾"/20	16.9/5.2	2
48/1220	8.0/11.5	¾"/20	27.8/8.5	3
60/1525	8.0/11.5	¾"/20	32.6/9.9	4
72/1830	8.0/11.5	¾"/20	40.6/12.4	4
31/790	11.2/16.1	¾"/20	13.7/4.2	2
36/915	11.2/16.1	¾"/20	17.0/5.2	2
48/1220	11.2/16.1	¾"/20	24.9/7.6	3
60/1525	11.2/16.1	¾"/20	32.9/10.0	4
72/1830	11.2/16.1	¾"/20	40.9/12.5	4
31/790	14.0/20.2	¾"/20	13.5/4.1	2
36/915	14.0/20.2	¾"/20	16.8/5.1	2
48/1220	14.0/20.2	¾"/20	24.7/7.5	3
60/1525	14.0/20.2	¾"/20	32.7/9.9	4
72/1830	14.0/20.2	¾"/20	40.7/12.4	4

FM NOTES:

- The Series AH2 hose has been tested and Approved by FM Global for use in wet, dry and preaction systems per NFPA 13, 13R, and 13D and FM data sheets 2-0, 2-5, and 2-8. FM 1637 standard for safety include, but are not limited to, pressure cycling, corrosion resistance, flow characterisitics, vibration resistance, leakage, mechanical and hydrostatic strength.
- EXAMPLE: A 48-inch hose installed with two 30° bends and two 90° bends is permitted and considered equivalent to the data in the table shown above. In this example, the total number of degrees is 240°, which is less than the allowable 270°.

5.3 PERFORMANCE – FRICTION LOSS DATA

Series AH2 and AH2-CC Braided Hose
Style AB1, AB2, AB4, AB5, AB7, AB7 Adj., AB8, AB10, AB11 and AB12 Brackets

Length of Stainless Steel Flexible Hose mm/inches	Outlet Size mm/inches	Equivalent Length of steel pipe according to EN 10255 DN 25 (33,7 x 3,25) meters/feet	Maximum Number of 90° Bends at 3"/76.2 mm Bend Radius meters/feet
31/790	15 mm/½" 20 mm/¾"	5.5/18.0	3
36/915	15 mm/½" 20 mm/¾"	6.4/21.0	3
48/1220	15 mm/½" 20 mm/¾"	8.5/27.9	3
60/1525	15 mm/½" 20 mm/¾"	10.7/35.1	4
72/1830	15 mm/½" 20 mm/¾"	12.8/42.0	4

VDS CEILING MANUFACTURERS LIST

AB1, AB2, AB7, AB10 ,AB11

1. AMF
2. Armstrong
3. Chicago Metallic
4. Dipling
5. Durlum
6. Geipel
7. Gema-Armstrong
8. Hilti
9. Knauf
10. Lafarge
11. Linder
12. Odenwald
13. Richter
14. Rigips
15. Rockfon Pagos
16. Suckow & Fischer
17. USG Donn

AB4

No specific approval

AB5, AB8

1. Hilti
2. Knauf
3. Lafarge
4. Lindner
5. Rigips

Series AH2 and AH2-CC Braided Hose
Style AB1, AB2, AB3, AB4, AB5, AB7, AB8, and AB10 Brackets

Length of Stainless Steel Flexible Hose mm/inches	Outlet Size mm/inches/type	Equivalent Length of steel pipe according to EN 10255 DN 25 (33,7 x 3,25) meters/feet	Maximum Number of 90° Bends at 3"/76.2 mm Bend Radius
790/31	15 mm/½"/Straight 20 mm/¾"/Straight	1.8/6.0	2
915/36	15 mm/½"/Straight 20 mm/¾"/Straight	3.6/11.9	3
1220/48	15 mm/½"/Straight 20 mm/¾"/Straight	4.3/14.0	3
1525/60	15 mm/½"/Straight 20 mm/¾"/Straight	4.1/13.6	3
1830/72	15 mm/½"/Straight 20 mm/¾"/Straight	5.5/18.1	3

Series AH2 Braided Hose
Style AB1, AB2, AB3, AB4, AB5, AB7, AB8, AB10 and AB12 Brackets

Length of Flexible Hose mm inches	Equivalent Length of 1"/33.7 mm Sch. 40 Pipe	
	Straight Configuration	Bend Configuration
790 31	0.87 2.9	2.70 8.9
915 36	1.00 3.3	2.80 9.2
1220 48	2.23 7.3	4.66 15.3
1525 60	2.90 9.5	6.5 21.3
1830 72	3.31 10.9	7.16 23.5

CCCF NOTE

- Friction loss data is in accordance with GB5135.16 tested at a flow rate of 114 liters per minute (30 gallons per minute).

6.0 NOTIFICATIONS

WARNING

- **Read and understand all instructions before attempting to install, remove, adjust, or maintain any Victaulic piping products.**
- **Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in death or serious personal injury and property damage.

WARNING

- **It is the responsibility of the system designer to verify suitability of 300-series stainless steel flexible hose for use with the intended fluid media within the piping system and external environments.**
- **The effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on 300-series stainless steel flexible hose must be evaluated by the material specifier to confirm system life will be acceptable for the intended service.**

Failure to follow these instructions could cause product failure, resulting in serious personal injury and/or property damage.

7.0 REFERENCE MATERIALS – CHARACTERISTICS

VicFlex Maximum Load Values

Series AH2 Hose with 24" Bracket

Model Size	Actual Length ft m	Total Load lb	Total Load N	Max. Uniform Load lb/linear ft	Max. Uniform Load N/linear m
31/790	2.6 0.8	5.2	23	2.6	38
36/915	3 0.9	5.5	25	2.8	40
48/1220	4 1.2	6.3	28	3.1	46
60/1525	5 1.5	7.0	31	3.5	51
72/1830	6 1.8	7.7	34	3.9	57

Series AH2 Hose with 48" Bracket

Model Size	Actual Length ft m	Total Load lb	Total Load N	Max. Uniform Load lb/linear ft	Max. Uniform Load N/linear m
31/790	2.6 0.8	6.1	27	1.5	22
36/915	3 0.9	6.4	29	1.6	23
48/1220	4 1.2	7.2	32	1.8	26
60/1525	5 1.5	7.9	35	2.0	29
72/1830	6 1.8	8.7	39	2.2	32

Total Load is defined as the sum of the weights of the following:

- water-filled flexible sprinkler hose with threaded end fittings, including a typical fire sprinkler
- bracket assembly (any applicable Victaulic bracket model of the relevant associated size)

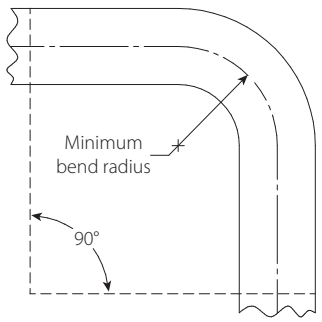
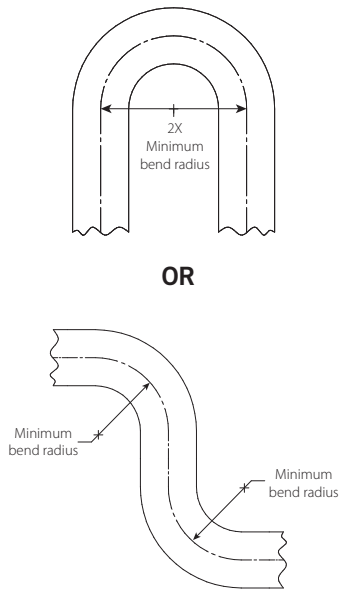
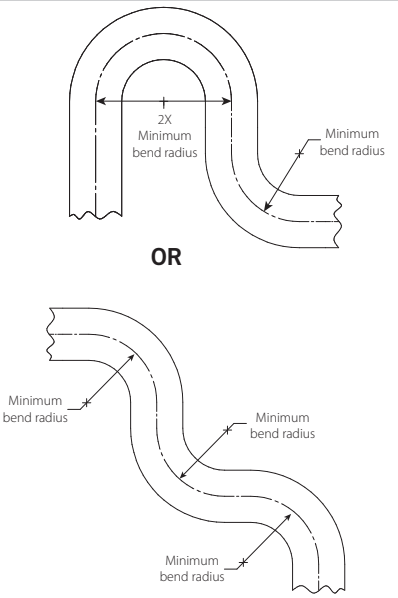
ASTM C 635: Suspension System Load-Carrying Capabilities (excerpted)

Suspension System	Actual Length ft/m	Min. Allowable Uniform Load lb/linear ft	Min. Allowable Uniform Load N/linear m
Direct Hung	Light	5.0	75.7
	Intermediate	12.0	181.0
	Heavy	16.0	241.7

SUMMARY: All direct-hung suspension system duty classifications per ASTM C 635 are able to withstand the maximum water-filled weight of the *VicFlex* sprinkler hose and bracket.

7.0 REFERENCE MATERIALS – CHARACTERISTICS (CONTINUED)

Flexible Hose In-Plane Bend Characteristics

One Bend	Two Bends	Three Bends
		

NOTE

For out-of-plane (three-dimensional) bends, care must be taken to avoid imparting torque on the hose.

I-VicFlex-AB1-AB2-AB10
I-VicFlex-AB3
I-VicFlex-AB4
I-VicFlex-AB7
I-VicFlex-AB8
I-VicFlex-AB12
I-VicFlex-ABBA
I-VicFlex-ABMM

ANVIL®
INTERNATIONAL

FIRE PROTECTION
PIPING PRODUCTS

ANVIL® INTERNATIONAL
Building Connections That Last

BUILDING CONNECTIONS THAT LAST SINCE 1850

ANVIL COMBINES THE LATEST TECHNOLOGY, UP TO DATE FIRE PROTECTION RATINGS, RECOGNIZED MANUFACTURING EXPERTISE AND A TRUSTED HISTORY THAT HAS MADE ANVIL THE GO TO SOURCE FOR FIRE PROTECTION PIPING PRODUCTS.

ANVIL® INTERNATIONAL

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THREADED FITTINGS

Anvil International offers the most complete line of threaded iron products in the industry, offering domestic cast and malleable iron pipe fittings. SPF/Anvil brand provides high quality/high value, internationally sourced cast, malleable and ductile iron pipe fittings.

CAST IRON

- Branded with Anvil logo confirms manufactured in Columbia, PA USA
- Most complete line in the industry, available in ¼" - 12"
- ¼" - 4" UL Listed FM Approved at 400 PSI
- Class 125 and 250 Extra Heavy CI threaded fittings
- Threads NPT per ASME B1.20.1
- Air tested

MALLEABLE IRON

- Branded with the Anvil logo confirms manufactured in Columbia, PA USA
- Broadest line of fitting sizes available in both black or galvanized finishes, Class 150 and 300
- All Class 150 fittings are UL Listed and FM Approved at 300 PSI
- All Elbows and Tees ⅜" and larger are 100% air tested at minimum of 100 PSI
- Air tested

CAST IRON

- Available in 1" - 2½"
- All SPF Cast Iron is UL Listed and FM Approved at 300 psi
- Class 125 Standard
- Air tested

MALLEABLE IRON

- Available in ⅛"- 6" both black orgalvanized finishes, Class 150 and 300
- All SPF Malleable Iron is UL Listed and FM approved
- ⅛" - 2" Fittings are UL Listed and FM Approved at 500 PSI and 2½"- 6" Fittings and All Bushings are UL Listed and FM Approved at 300 PSI
- Air tested

DUCTILE IRON

- Available in 1" - 2½"
- All SPF Ductile Iron is UL Listed and FM Approved at 500 PSI
- Class 150 Standard DI threaded fittings

GROOVED COUPLINGS

Anvil International offers Gruvlok, domestic, and SPF/Anvil, internationally sourced, grooved couplings and fittings to meet any of your requirements. Gruvlok grooved products are manufactured at our state of the art facility in Columbia, PA USA. All grooved products for Fire Protection are UL/ULC Listed and FM Approved.

SLIDELOK RIGID READY FOR INSTALLATION COUPLING

- Slide action eases assembly and reduces installation time
- 1¼" - 8", Painted or Galvanized
- Manufactured in Columbia, PA USA
- Up to 450 PSI
- UL / FM Approved
- Wet, Dry or Freezer applications, Pre-Lubricated Grade "E" EPDM, 4Seal Gasket
- Can be used with Gruvlok or SPF/Anvil fittings

SLIDELOK 74FP

RIGID COUPLING

- 1¼" - 8", Painted or Galvanized
- 300 PSI
- UL / FM Approved
- Wet or Dry Systems
- Pre-Lubricated Grade "E" EPDM, Type A Gasket

FP7400

C-4

FLEXIBLE COUPLING

- 1¼" - 8", Painted or Galvanized
- 300 PSI
- UL / FM Approved
- Wet or Dry Systems
- Pre-Lubricated Grade "E" EPDM, Type A Gasket

FP7000

C-3

REDUCING COUPLING

- 1¼" - 8", Painted or Galvanized
- 300 PSI
- UL / FM Approved
- Wet or Dry Systems
- Pre-Lubricated Grade "E" EPDM, Type A Gasket

7010FP

RC-2

GROOVED FITTINGS/FLANGES

Anvil International offers domestic and globally sourced grooved couplings and fittings to meet your requirements. Gruvlok grooved products are manufactured at our state of the art facility in Columbia, PA USA. All grooved products for Fire Protection are UL/ULC Listed and FM Approved.

STANDARD PATTERN ELBOWS AND TEES

- Designed to provide minimal pressure drop and uniform strength
- 300 PSI rating
- UL / FM Approved
- Standard Pattern Fittings
- Reducing, Cross, 45 and 22½ available
- Painted or Galvanized Finishes

GRUVLOK 7050 AND 7060

SPF/ANVIL E-1 AND T-1

SHORT PATTERN ELBOWS AND TEES

- 2" - 8", 300 PSI Rating
- UL / FM Approved
- Short Pattern Fitting System
- CAD design increases internal diameters and provides superior flow capabilities
- Painted or Galvanized Finishes

GRUVLOK FP7450 AND FP7460

SPF/ANVIL SE-1 AND ST-1

GROOVED END CAPS

- 1" - 12", 500 PSI Rating
- Used with all of Anvil's grooved offerings; Gruvlok, SlideLok and SPF Couplings
- UL / FM Approved

GRUVLOK 7074*

SPF/ANVIL SK-1

DRAIN ELBOW

- 1¼" - 8", Painted or Galvanized
- 300 PSI
- UL / FM Approved
- Wet or Dry Systems
- Pre-Lubricated Grade "E" EPDM, Type A Gasket

GRUVLOK 7050DR

SPF/ANVIL E-9

END OF THE LINE ELBOW

- Transition from grooved to female thread is required
- Allow for convenient connection of drains, vents, pressure gauges as well as direct connection of an end of line sprinkler head
- 300 PSI
- UL / FM Approved

SPF/ANVIL®

SE-5

MECHANICAL TEES

- Quick and easy outlet installation at any location along the pipe without welding
- 7045 and 7046, 500 PSI UL/FM
- MT-1 and MT-2, 300 PSI UL/FM
- Branch or Cross connection

GRUVLOK®

7045 CLAMP-T, FPT BRANCH AND 7046FP CLAMP-T, GROOVED BRANCH

SPF/ANVIL®

MT-1, THREADED FPT BRANCH AND MT-2, GROOVED BRANCH

THREADED BRANCH TEE

- Steel electro-plated u-bolt to save space and allow easy installation in confined places
- Ideal for direct connection to sprinkler heads
- Available 1¼" x ½" - 2½" x 1"
- 300 PSI
- UL / FM Approved

SPF/ANVIL®

MT-30

GROOVED FLANGE ADAPTER

- Allows direct connection of class 125 or class 150 flange
- 2" - 12", Painted or galvanized
- UL Listed and FM Approved
- 300 PSI
- Steel adapter insert available

GRUVLOK®

7012*

SPF/ANVIL®

F-3

GASKET GUIDE

Anvil International offers a variety of pressure responsive gasket styles. Each serves a specific function while utilizing the same basic sealing concept.

1. **"C" STYLE**
   The "C" Style cross section configuration is the most widely used gasket. It is the gasket style provided as standard in many Gruvlok Couplings. Grade "E" is the standard for fire protection gaskets.

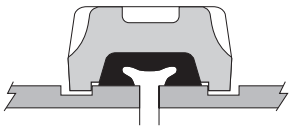
2. **FLUSH GAP®**
   Designed to prohibit contaminates from building up in the gasket cavity. The centering rib fits flush over the gap between the two pipe ends thus closing off the gasket cavity. = for use in dry fire protection systems.

3. **SLIDELOK™ PRESSURE RESPONSIVE**
   SlideLOK gasket patent pending design easily slides over the grooved pipe end for quick installation. The gasket design provides a 360˚ consistent compression seal when fully installed. The internal ribs are design to prohibit contaminants from building in the gasket cavity by engaging individually with each pipe end. Performance of the gasket is equivalent to the Gruvlok Flush Gap Gasket.

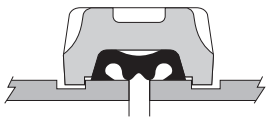
4. **FLANGE**
   A specially designed gasket for the Fig. 7012 and 7013 Flange provides for a reliable seal on both the pipe and the mating flange.

5. **CLAMP-T®**
   These gaskets conform to the curved exterior of the pipe to provide a pressure responsive seal. This unique design is only used with Fig. 7045, 7046 Clamp-T and Fig. 7047, 7048, and 7049 Clamp-T Crosses.

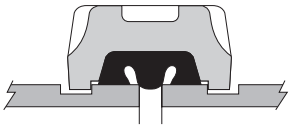
6. **REDUCING COUPLING**
   The centering rib allows for pipe positioning and serves to keep the smaller pipe from telescoping during installation. Used only with the Fig. 7010 Reducing Coupling.



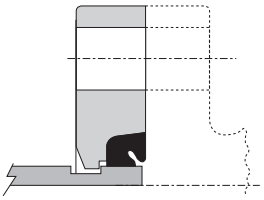
1 "C" STYLE



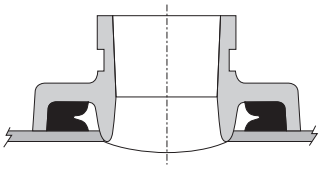
2 FLUSH GAP®



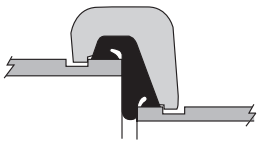
3 SLIDELOK™ PRESSURE RESPONSIVE



4 FLANGE



5 CLAMP-T®



6 REDUCING COUPLING

FIRE PROTECTION GASKET GRADE INDEX

GRADE	TEMPERATURE RANGE	COMPOUND	COLOR CODE	GENERAL SERVICE APPLICATION
E (TYPE A)	-40°F to +150°F (-40°C to 66°C)	Pre-Lubricated	Violet	Wet & Dry (oil free air) Pipe in Fire Protection Systems. For dry pipe systems, Gruvlok Xtreme™ Temperature Lubricant is required.
E	-40°F to +230°F (-40°C to 110°C)	EPDM	Green	Water, dilute acids, alkalies, salts, and many chemical services not involving hydrocarbons, oils, or gases. Excellent oxidation resistance. NOT FOR USE WITH HYDROCARBONS
L	-40°F to +350°F (-40°C to +177°C)	Silicone	Red	Recommended for dry, hot air and some high temperature chemical services. "C" Style only

PIPE HANGERS

Anvil International's manufacturing facility in Henderson, Tennessee has over 175,000 square feet dedicated to producing a complete line of pipe hangers and supports for all fire protection applications. These include clamps, braces, inserts, rods, slices and guides to exacting standards and certified ISO 9001 quality.

STEEL PIPE HANGER RINGS AND CLAMPS

69 (AF 300*)
ADJUSTABLE SWIVEL RING
SIZE RANGE: ½" - 8"
c UL us LISTED

260 (AF 371*)
ADJUSTABLE CLEVIS HANGER
SIZE RANGE: ½" - 30"
c UL us LISTED

65
LIGHT DUTY ADJUSTABLE CLEVIS
SIZE RANGE: ½" - 4"

261 (AF 400*)
RISER CLAMP
SIZE RANGE: ¾" - 24"
c UL us LISTED

BEAM CLAMPS

92 (AF 100*)
C-TYPE STANDARD THROAT
SIZE RANGE: ⅜" - ½"
c UL us LISTED

93 (AF 103*)
C-TYPE WIDE THROAT
SIZE RANGE: ⅜" - ½"
c UL us LISTED

94
WIDE THROAT TOP BEAM
SIZE RANGE: ⅝" - ¾"
c UL us LISTED

AF090
RESTRAINING STRAP
SIZE RANGE: ⅜" - ½"
c UL us LISTED

AF090R
RETROFIT RESTRAINING STRAP
SIZE RANGE: ⅜" - ½"
c UL us LISTED

133
STANDARD DUTY BEAM CLAMP
SIZE RANGE: 4" - 12"
c UL us LISTED

134
HEAVY DUTY BEAM CLAMP
SIZE RANGE: 4" - 12"
c UL us LISTED

218
MALLEABLE BEAM CLAMP
c UL us LISTED

*FORMERLY AFCON PRODUCT

CPVC PIPE HANGERS

184 (AF 515*)
DOUBLE OFFSET HANGER AND RESTRAINER
SIZE RANGE: ¾" - 2"

185 (AF 513*)
ONE HOLE PIPE STRAP
SIZE RANGE: ¾" - 2"

186 (AF 510*)
TWO HOLE PIPE STRAP
SIZE RANGE: ¾" - 3"

187 (AF 511*)
TWO HOLE 90° SIDE MOUNT STRAP
SIZE RANGE: ¾" - 2"

188
TWO HOLE STAND-OFF HANGER
SIZE RANGE: ¾" - 2"

188R (AF 514*)
TWO HOLE STAND-OFF HANGER AND RESTRAINER
SIZE RANGE: ¾" - 2"

PIPE SUPPORTS

192
ADJUSTABLE PIPE SADDLE
SIZE RANGE: 2" - 12"

137/137S
STANDARD U-BOLTS
SIZE RANGE: ½" - 36"

264 (AF 707*)
ADJUSTABLE PIPE SADDLE
SIZE RANGE: 2½" - 36"

BRACKETS AND CEILING PLATE

206 (AF 556, 560, 565*)
STEEL SIDE BEAM BRACKET
SIZE RANGE: ⅜" - ⅝"

207 (AF 553, 555*)
THREADED STEEL SIDE BEAM BRACKET
SIZE RANGE: ⅜" - ½"

194 (AF 770*)
STEEL BRACKET

610
CARBON STEEL CEILING PLATE
SIZE RANGE: ⅜"

550
REVOLVER SWIVEL BRACKET
SIZE RANGE: ⅜"

551
REVOLVER BRACKET
SIZE RANGE: ⅜"

*FORMERLY AFCON PRODUCT

SEISMIC BRACES

LEADING INNOVATION WITH THE BROADEST SEISMIC BRACING & HANGER SOLUTION

AF086
ADJUSTABLE STRUCTURAL BRACE ATTACHMENT

AF087
STRUCTURAL BRACE ATTACHMENT

AF772
ADJUSTABLE STEEL BEAM ATTACHMENT

AF778
UNIVERSAL STRUCTURAL BRACE ATTACHMENT

AF075
SWAY BRACE SWIVEL ATTACHMENT

AF076
UNIVERSAL SWIVEL SWAY BRACE ATTACHMENT

AF771
SWAY BRACE SWIVEL ATTACHMENT

AF775
STRUCTURAL BRACE ATTACHMENT

AF777
SWIVEL ATTACHMENT

AF001
MODEL Q SWAY BRACE CLAMP

AF035
MODEL K SWAY BRACE CLAMP

AF411
LONGITUDINAL SWAY BRACE FITTING

AF074
SWAY BRACE ATTACHMENT FITTING

AF310
SURGE RESTRAINER

AF773
SURGE RESTRAINER

SEISBRACE® SOFTWARE

DESIGN SMARTER WITH ANVIL'S SEISBRACE® DESIGN TOOL

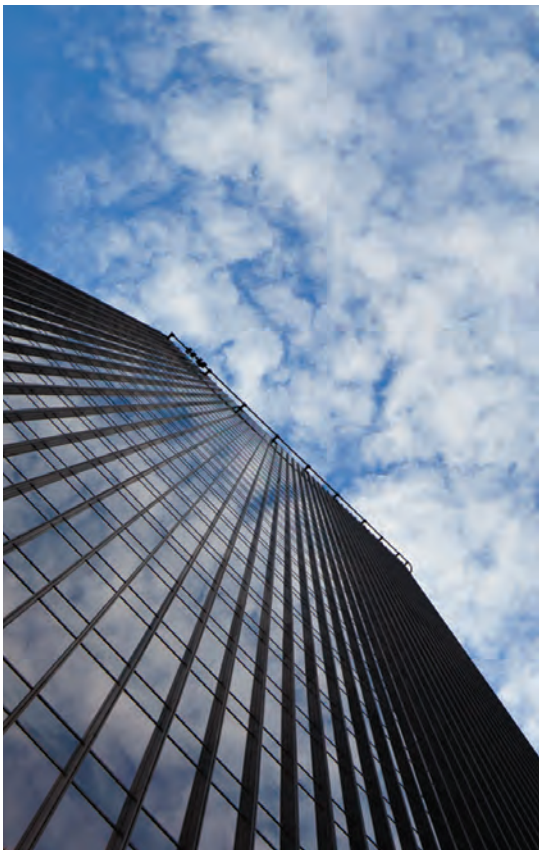
SEISMIC PROTECTION FOR YOUR FIRE SPRINKLER SYSTEM

Experience has shown that most damage after an earthquake comes from the failure of the non-structural systems in a building not the failure of the structure itself. The Federal Emergency Management Agency (FEMA) has identified one of the primary causes of property damage from earthquakes as the failure of electrical, gas and water lines contributing to fires after an earthquake. NFPA 13 requires that fire sprinkler systems be braced to resist seismic forces, so that these critical systems will be operational for the protection of lives and property after a seismic event.

Anvil can help your fire sprinkler system to comply with the requirements of NFPA 13 (2016). The new and improved web based SeisBrace™ software will assist a fire sprinkler system designer to calculate a seismic coefficient for a project, perform zone of influence calculations, and select the most cost efficient and compliant seismic bracing products. The SeisBrace program creates a submittal with all calculations shown, a summary of the structural and system attachments and full submittal sheets for all bracing components.

FEATURES

- Designed to calculate the zone of influence for a given sway brace location.
- Intuitive and self-correcting to assure proper design of brace assemblies
- Generates full submittal package with calculations, details and product data pages
- Allows application of ASCE 7, per NFPA 13, for the most efficient brace layout
- Free with online registration
- Specify FM or UL Listed Components



WWW.SEISBRACE.COM

VALVES

COMPACT, COST-EFFECTIVE VALVES

Designed for use in grooved-end pipe fire protection systems and related equipment.

FIG. AN7722-3A
GROOVED BUTTERFLY VALVE

- 2" - 10", 300 PSI rating
- Valve features double-seal disc design
- Resilient EPDM coating
- Stems 416 stainless steel
- Supervisory service and auxiliary switches reated for 0.5 amp at 125 VDC, 0.25 amp at 250 VDC, and 4 amps at 125 VAC
- UL / FM Approved

FIG. 78FP
GROOVED CHECK VALVE

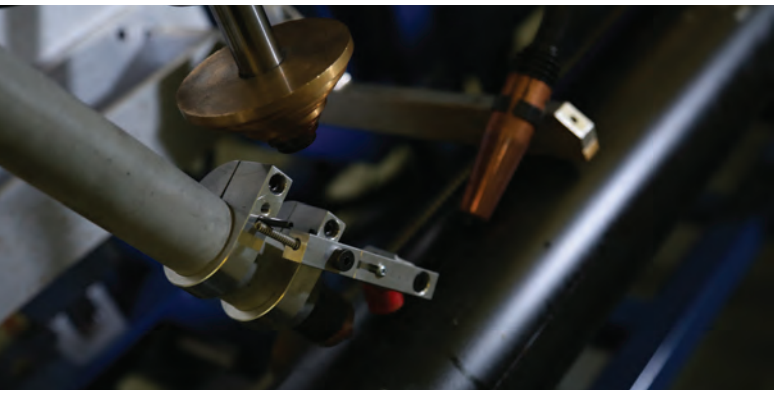
- 2" - 12", 300 PSI rating
- Quick, non-slam closure
- Leak free seal
- UL / FM Approved

VALVES & INDICATOR POSTS
GROOVED CHECK VALVE

- Avaliable in Non-Rising Stem and O.S.&Y. Rising Stem Resilient Wedge Gate Valves, and Swing-Type Check Valves
- Ideal for system control valves, as well as flanged fire pump applications
- Underground and wall Indicator Posts
- Indicator Post provides a means to operate a buried or otherwise inaccessible valve
- Indicator Post clearly indicates valve open or shut

NORTH ALABAMA PIPE (NAP)

Founded in 1983, NAP is a manufacturer of fabrication equipment, including automatic welders, plasma cut-off equipment, hole cutting equipment, make-on machines and pipe threaders. NAP, innovators of pipe fabrication equipment.



WELDERS

- Universal Welder, Line Welder, Manual Station Welder and Plasma cutting hole system
- Cycle time to cut hole and weld outlet onto pipe is approximately 32 seconds for ½” outlets and 55 seconds for 2½” outlets
- Programmable system to weld Merit outlets and be programmed for other outlets
- Cutting

CUTTING

- Quick Cut Machine Designed to cut 2"- 8" pipe sizes and up to 25' long using complete air plasma system
- Big Cut Machine Designed to cut 2"- 16" pipe sizes and up to 25' long using complete air plasma system
- Thread Line

THREAD LINE

- Make On Machine makes on 1"- 2" fittings with no operator adjustments with a switch control to easily change between cast, ductile and malleable fittings
- Small Cut Machine designed as a complete cutting system for ½"- 2" pipe utilizing a cold saw

“THE UNMATCHED RANGE OF DOMESTIC AND GLOBALLY SOURCED PRODUCTS FOR FIRE PROTECTION PIPING SYSTEMS OFFERED BY ANVIL INTERNATIONAL PROVIDES VERSATILE AND DEPENDABLE PERFORMANCE FOR WIDE RANGE OF APPLICATIONS.”

BRANDS OF ANVIL INTERNATIONAL

Anvil product lines include malleable and cast iron fittings, unions and flanges; seamless and welded steel pipe nipples; steel pipe couplings; universal anvilets; forged steel fittings and unions; pipe hangers and supports; threaded rod; and engineered hangers

Anvil-Strut products include a complete line of channel in stock lengths of 10 and 20 feet, with custom lengths available upon request. A variety of fittings and accessories are also offered. All products can be ordered in an assortment of finishes and material choices including SupR-GreenTM, Zinc Trivalent Chromium, pre-galvanized, hot-dipped galvanized, electro-galvanized, aluminum, plain, and stainless steel.

The SPF/Anvil product line includes a variety of internationally sourced products such as grooved couplings, fittings, cast iron, malleable iron and ductile iron threaded fittings, steel pipe nipples, as well as tee-lets.

Anvil EPS-Engineered Pipe Supports are products used to support piping systems under thermal, seismic, and other dynamic loading conditions. The product line encompasses variable spring hangers, constant supports, sway struts and snubbers as well as standard and special design clamps. Anvil EPS brings the highest quality products and innovative engineering solutions to common and uncommon piping system problems.

The Merit product line includes a variety of tee-lets and drop nipples for fire protection applications. Most Merit products are UL/ ULC Listed, FM Approved, and rated from 175 to 300 psi.

Catawissa hammer unions are offered in threaded ends and butt weld ends, and are interchangeable with most leading union manufacturers. Fully traceable and available with complete mill certifications, Catawissa's oilfield hammer union product line includes the standard ball-and-cone design plus our unique Figure 300 Flat Face design, where space and pipe line separation are a consideration.

The Gruvlok product line consists of couplings for grooved and plain-end fittings, butterfly valves and check valves; flanges; pump protection components; pipe grooving tools; as well as copper and stainless steel system components.

The Afcon seismic bracing line includes UL listed and FM approved structural attachments for concrete, wood or steel structural members like bar joist or I-beams, swivel connections that accept from 1" to 2" schedule 40 pipe. Afcon's seismic system attachments are engineered for up to 12" IPS steel pipe, copper tubing or plastic pipe.

We invented the concept of Flexible Fire Protection™. FlexHead systems connect sprinkler heads to sub-mains at least four times faster than hard pipe. Delivers even greater savings in retrofits. All our flexible sprinkler pipe and connections are UL Listed and FM Approved.

JB Smith is the leading manufacturer of oil country tubular fittings, swages and bull plugs – all meeting API specifications. Offering tubing nipples, casing nipples as well as a full line of traditional line pipe and oil country threads in every schedule, JB Smith is the resource for all your oilfield needs.

Steel pipe nipples and steel pipe couplings are manufactured in accordance with the ASTM A733 Standard Specification for Welded and Seamless Carbon Steel and Stainless Steel Pipe Nipples. Steel pipe couplings are manufactured in accordance with the ASTM A865 Standard Specification for Threaded Couplings, Steel, Black or Zinc-Coated (Galvanized) Welded or Seamless, for Use in Steel Pipe Joints. API couplings are manufactured in accordance with the API Specification for line pipe.

Founded in 1983, NAP is a manufacturer of fabrication equipment, including automatic welders, plasma cut-off equipment, hole cutting equipment, make-on machines and pipe threaders. NAP, innovators of pipe fabrication equipment.

CUSTOMER SERVICE CENTERS

UNITED STATES

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FAX: 708-534-5441
EMAIL: customerservice@anvilintl.com

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REGIONAL DISTRIBUTION CENTERS

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ILLINOIS
7979 W. 183rd Street, Unit D
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TEXAS
1401 Valley View Lane, Suite 150
Irving, TX 75061

PENNSYLVANIA
800 Malleable Road
Columbia, PA 17512

CALIFORNIA
551 North Loop Drive
Ontario, CA 91761

FLORIDA
236 Outlook Point Drive, Suite 100
Orlando, FL 32809

CANADA

ONTARIO
390 Second Avenue, Simcoe
P.O. Box 40
Ontario, Canada, N3Y 4K9

ANVIL MAINTAINS CONTRACTS WITH A CORE FLEET OF CARRIERS TO PROVIDE EFFICIENTLY CONSISTENT DELIVERY SERVICES TO OUR CLIENTS.

ANVIL® INTERNATIONAL

ANVIL®
INTERNATIONAL
Building Connections That Last

www.anvilintl.com

ANV_BRO_FP_190205

Adjustable Swivel Ring Hangers

Fig. 141 & 141F NFPA Swivel Ring Hanger

Fig. 141 PRE-GALVANIZED

Fig. 141F PRE-GALVANIZED WITH FELT LINING

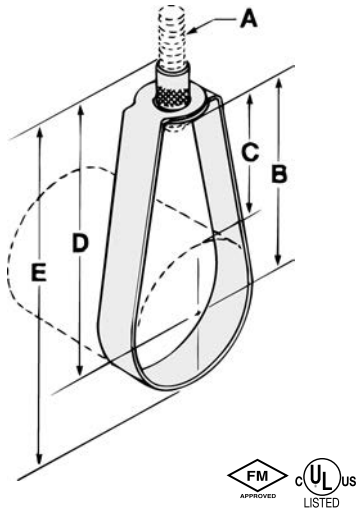
FUNCTION: Designed for the suspension of non-insulated stationary pipe lines. The knurled insert nut that allows a vertical adjustment after installation, is tapped to NFPA reduced rod size standards. Fig. 141F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound.

APPROVALS: Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), and Factory Mutual Approved for sizes ¾" to 8". Complies with Federal Specifications A-A-1192A (Type 10), and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 10).

ORDERING: Specify pipe size and figure number.

Pipe Size	Rod Size A	B	Adj. C	D	E	Max. Rec. Load/lbs.	Wt. Each (in lbs.)
1/2	3/8	1 7/8	1 7/16	2 3/4	3 1/16	300	.10
3/4	3/8	1 11/16	1 1/8	2 1/2	3 1/16	300	.10
1	3/8	1 5/8	1	2 1/2	3 3/16	300	.10
1 1/4	3/8	1 15/16	1 1/16	2 13/16	3 9/16	300	.11
1 1/2	3/8	2 1/8	1 1/16	3 1/8	3 7/8	300	.11
2	3/8	2 7/16	1 1/8	3 5/16	4 3/8	300	.14
2 1/2	3/8	3 1/16	1 5/8	3 15/16	5 3/8	525	.19
3	3/8	3 11/16	1 7/8	4 9/16	6 5/16	525	.23
3 1/2	3/8	3 3/4	1 7/8	4 5/8	6 5/8	525	.25
4	3/8	4 3/16	1 7/8	5 1/16	7 5/16	650	.30
5	1/2	4 5/8	1 5/8	5 5/8	8 3/8	1000	.50
6	1/2	5 5/8	2 1/4	6 1/2	9 13/16	1000	.58
8	1/2	6 13/16	2 7/16	7 15/16	12 1/4	1000	.90

Note: *If ordering Fig. 141F felt lined hangers for pipe sizes of 3 1/2" or under, order the next largest size to allow for the thickness of the felt lining.*



MATERIAL: Low carbon steel

Fig. 151 & 151F Swivel Ring Hanger

Fig. 151 PRE-GALVANIZED

Fig. 151F PRE-GALVANIZED WITH FELT LINING

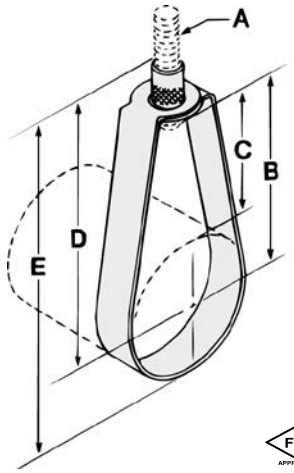
FUNCTION: Designed for the suspension of non-insulated stationary pipe lines. The knurled insert nut, allows for vertical adjustment after installation. Fig. 151F has a layer of felt which separates the pipe from the hanger to reduce vibration and sound.

APPROVALS: Underwriters' Laboratories Listed in the U.S. (UL) and Factory Mutual Approved for all sizes. Complies with Federal Specification A-A-1192A (Type 10), and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 10).

ORDERING: Specify pipe size and figure number.

Pipe Size	Rod Size A	B	Adj. C	D	E	Max. Rec. Load/lbs.	Wt. Each (in lbs.)
2 1/2	1/2	2 3/4	1 1/4	3 11/16	5 1/8	600	.33
3	1/2	3 1/8	1 1/8	4	5 7/8	600	.35
3 1/2	1/2	3 5/8	1 1/2	4 5/16	6 5/8	600	.37
4	5/8	3 7/8	1 1/4	4 15/16	7 1/8	1000	.48
5	5/8	4 3/8	1 3/8	5 5/8	8 1/2	1000	.57
6	3/4	5 5/16	2	6 11/16	10 1/8	1250	1.06
8	3/4	6 15/16	2 5/8	8 5/16	12 7/8	1250	1.32

Note: *If ordering Fig. 151F felt lined hangers for pipe sizes of 3 1/2" or under, order the next largest size to allow for the thickness of the felt lining.*



MATERIAL: Low carbon steel

PHD Manufacturing, Inc. • 44018 Columbiana-Waterford Road • Columbiana, OH 44408
Toll Free (800) 321-2736 • Phone: (330) 482-9256 • Fax: (330) 482-2763 • www.phd-mfg.com

Fig. 20 & 21 CONTINUOUS THREADED ROD

Fig. 20* PLAIN
Fig. 21 ELECTRO-GALVANIZED

*Available in stainless steel. To order, specify 304 or 316 and add suffix SS to figure number.
Price on request.

FUNCTION: Useful in applications where stud lengths cannot be predetermined.

MATERIAL: Low carbon steel

ORDERING: Specify rod size, length and figure number.

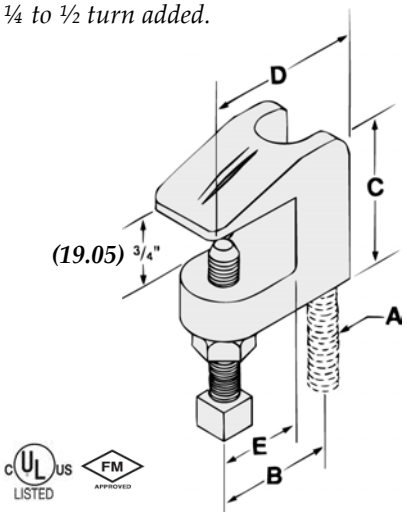
Rod Size	Packaging Feet Per Bundle						Max. Rec. Load 650°F (343°C)		Max. Rec. Load 750°F (399°C)		Wt. Per Inch	
	6ft.	(1.83)	10ft.	(3.05)	12ft.	(3.66)	lbs.	kN	lbs.	kN	lbs.	kg
1/4-20	300	(91.44)	500	(152.4)	600	(182.88)	240	(1.07)	210	(.93)	.12	(.05)
3/8-16	150	(45.72)	250	(76.2)	240	(73.15)	730	(3.25)	540	(2.40)	.29	(.13)
1/2-13	72	(21.95)	120	(36.58)	144	(43.90)	1350	(6.01)	1010	(4.49)	.54	(.25)
5/8-11	48	(14.63)	80	(24.38)	96	(29.26)	1810	(8.05)	1610	(7.16)	.83	(.38)
3/4-10	30	(9.14)	50	(15.24)	60	(18.29)	2710	(12.05)	2420	(10.76)	1.25	(.57)
7/8-9	24	(7.32)	40	(12.19)	48	(14.63)	3770	(16.77)	3360	(14.95)	1.65	(.75)
1-8	12	(3.66)	20	(6.10)	24	(7.32)	4960	(22.06)	4420	(19.66)	2.25	(1.02)

BEAM CLAMPS

Fig. 350
BEAM CLAMP

Set Screw Torque				
Nominal Thread Size		3/8	1/2	Caution should be taken not to over tighten the set screw
Rec. Torque	in-lbs	60	125	
	N-m	(6.8)	(14.1)	

Note: *When a torque wrench is unavailable, the setscrew should be tightened so it contacts the I-beam and then an additional ¼ to ½ turn added.*



FUNCTION: Designed for attaching hanger rod to the top flange of a beam or bar joist, where the flange thickness does not exceed 3/4 inch (19.05mm). The open U design permits rod adjustment. The universal design of the 3/8" Fig. 350 allows it to be used in an inverted position on the bottom flange of a beam as well.

APPROVALS: Underwriters' Laboratories Listed in the U.S. (UL), Canada (CUL), for sizes 3/8" to 7/8" only. Factory Mutual Approved for rod sizes 3/8" and 1/2" only. Complies with Federal Specifications A-A-1192A (Type 19) and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 19). Fig. 350 sized for 3/8" rod can be used in an inverted position (bottom of beam) and follows the same U.S. (UL), Canada (CUL), and Factory Mutual Approvals. Used in this manner the 3/8" Fig. 350 also complies with Federal Specifications A-A-1192A (Type 23) and Manufacturers' Standardization Society ANSI/SP-69 and SP-58 (Type 23) (Approvals are only for Fig. 350 with locknut).

MATERIAL: Malleable iron with hardened steel cup point set screw

FINISH: Plain or electro-galvanized

ORDERING: Specify rod size, finish and figure number.

Rod Size A	B		C		D		E		Max. Pipe Size		Max. Rec. Load lbs.	Max. Rec. Load kN	Wt. Each lbs.	Wt. Each kg
*1/4	7/8	(22.23)	1 1/2	(38.10)	1 5/8	(41.28)	1/2	(12.70)	N/A	N/A	250	(1.11)	.34	(.15)
Δ 3/8	7/8	(22.23)	1 1/2	(38.10)	1 5/8	(41.28)	1/2	(12.70)	4	(100)	400	(1.78)	.33	(.15)
1/2	1	(25.40)	1 1/2	(38.10)	1 11/16	(42.86)	1/2	(12.70)	8	(200)	500	(2.22)	.34	(.15)
5/8	1 1/16	(26.99)	1 1/2	(38.10)	1 7/8	(47.63)	5/8	(15.88)	8	(200)	600	(2.67)	.39	(.18)
3/4	1 5/16	(33.34)	1 3/4	(44.45)	2 3/8	(60.33)	5/8	(15.88)	8	(200)	800	(3.56)	.63	(.29)
7/8	1 5/16	(33.34)	1 3/4	(44.45)	2 3/8	(60.33)	5/8	(15.88)	8	(200)	1200	(5.34)	.60	(.27)

***Not UL or FM approved.**

Δ Reversible design approved for bottom beam use.

Unless otherwise specified, all dimensions on drawings and in charts are in inches and dimensions shown in parentheses are in millimeters.

Drop-in Anchors

INSIST ON FPPI®

Description

FPPI Drop-In Anchors and Mini Drop-In Anchors are UL listed in accordance with NFPA requirements. Zinc plating provides corrosion resistance. Follow NFPA requirements and installation instructions for proper use.

Installation Instructions:

STEP 1 Using a masonry bit suitable for the material being drilled, drill an appropriate diameter hole at the correct depth according to the table below.

Anchor Size	Drill Size	Minimum Hole Depth
⅜" Standard	½"	1 9/16"
½" Standard	⅝"	2"
⅜" Mini	½"	¾"

STEP 2 Insert the anchor into the hole until the edge of the anchor is flush* with the surface of the material the anchor is being installed in. **The Anchor may be installed at a greater depth by drilling the hole to the desired depth and threading the correct size bolt for the size anchor being installed and tapping the anchor into the drilled hole.*

STEP 3 After inserting the anchor to the desired depth, insert the correct size setting tool into the anchor and drive the plug into the anchor until the shoulder of the setting tool meets the edge of the anchor. The anchor is now installed and ready to be used.

Note: It is recommended that when used in cinder block, that the anchor be placed between the cells.

Average Pullout Values For 4000psi Concrete

Part Number	Bolt Size	Pullout Value
Standard Drop-In		
05-470-00	⅜"	5,530
05-471-00	½"	8,080
Mini Drop-In		
05-472-00	⅜"	1,980

Specifications

Materials:
Zinc Plated Steel

Part Numbers:
05-470-00 ⅜"
05-471-00 ½"
05-472-00 ⅜", mini

Use With:
05-475-00
Setting Tool ⅜"

05-474-00
Setting Tool ½"

05-476-00
Setting Tool ⅜", mini

3198 LIONSHEAD AVE
CARLSBAD, CA 92010
TEL + 1 760 599-1168
+ 1 800 344-1822
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UL LISTED

Model CV-1FR Grooved-End Riser Check Valves 2 Inch to 12 Inch (DN50 to DN300)

General Description

The TYCO Model CV-1FR Grooved-End Riser Check Valve is a compact and rugged swing-type unit that allows water flow in one direction and prevents flow in the opposite direction. A resilient elastomer seal facing on the spring-loaded clapper ensures a leak-tight seal and non-sticking operation. The Model CV-1FR Riser Check Valves are designed to minimize water hammer caused by flow reversal.

The Model CV-1FR Riser Check Valve is furnished with grooved ends and can be installed using GRINNELL Grooved Couplings or GRINNELL Figure 71 Flange Adapters. The Model CV-1FR Riser Check Valves have been designed with a removable cover for ease of field maintenance. These valves can be installed horizontally (with cover in the upward position) or vertically with the flow in the upward direction. Refer to Figure 6.

To facilitate their use in wet-type automatic sprinkler system risers, the Model CV-1FR Riser Check Valves are provided with threaded outlets for pressure gauges and a drain connection. They provide a more compact and economical alternative to an alarm check valve where a water motor alarm is not required. Provisions must be made for a local alarm using an approved flow switch (not included).

The Model CV-1FR Riser Check Valve is also Listed for use in conjunction with the TYCO DV-5 Deluge Valve in Preaction Systems under air pressure without the use of prime water.

The Model CV-1FR Riser Check Valves are a redesign for the Central Figure 590FR and GRINNELL Figure 590FR.

NOTICE

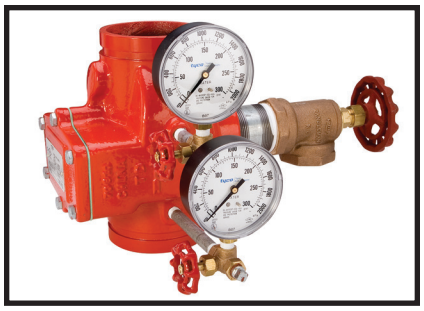
The Model CV-1FR Riser Check Valve described herein must be installed and maintained in compliance with this document and with the applicable standards of the NATIONAL FIRE PROTECTION ASSOCIATION, in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of this device.

Never remove any piping component nor correct or modify any piping deficiencies without first de-pressurizing and draining the system. Failure to do so may result in serious personal injury, property damage, and/or impaired device performance.

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

Technical Data

Approvals
UL, C-UL Listed
FM Approved
Sizes
2 in. to 12 in. (DN50 to DN300)
Maximum Working Pressure
300 psi (20,7 bar)
Valve Assembly Finish
Red, non-lead paint



UL c UL FM APPROVED

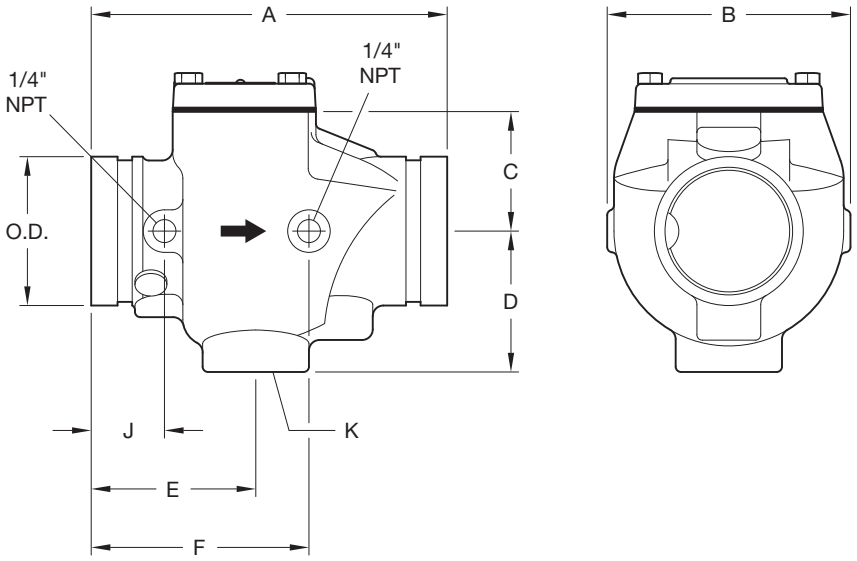
Installation

The Model CV-1FR Riser Check Valves are to be installed in accordance with this section:

1. The arrow cast on the Body must point in the direction of the flow.
2. Valves installed vertically must be positioned with the flow in the upward direction.
3. Valves installed horizontally must be positioned with the Cover facing up. Refer to Figure 6.
4. Grooved-end pipe couplings used with the Model CV-1FR Riser Check Valve must be installed in accordance with manufacturer's instructions.

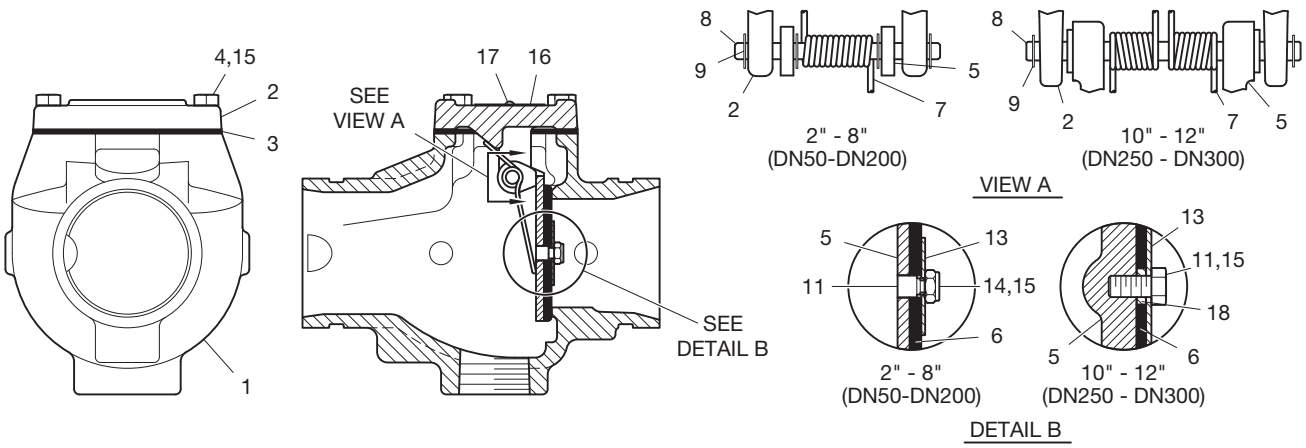
NOTE: *Valves should be installed a reasonable distance downstream from pumps, elbows, expanders, reducers, or other similar devices to extend the valve life. Standard piping practices call for a minimum of five times the pipe diameter for general use.*

IMPORTANT
Refer to Technical Data Sheet TFP2300 for warnings pertaining to regulatory and health information.



Nominal Pipe Size		Nominal Dimensions Inches (mm)								Cover Bolt Torque ft-lb (Nm)	Approx. Weight lb (kg)
ANSI Inches DN	O.D. Inches (mm)	A	B	C	D	E	F	J	K Inches NPT		
2 DN50	2.375 (60,3)	6.75 (171,5)	4.38 (111,3)	1.96 (49,8)	2.57 (65,3)	3.25 (82,3)	4.37 (111,0)	1.56 (39,6)	1	18 (25)	9.0 (4,5)
2-1/2 DN65	2.875 (73,0)	8.00 (203,2)	5.38 (136,7)	2.63 (66,8)	3.09 (78,5)	3.87 (98,3)	5.12 (130,0)	1.73 (43,9)	1-1/4	39 (54)	10.0 (4,5)
76,1 DN65	- (76,1)	8.00 (203,2)	5.38 (136,7)	2.63 (66,8)	3.09 (78,5)	3.87 (98,3)	5.12 (130,0)	1.72 (43,7)	1-1/4	39 (54)	10.0 (4,5)
3 DN80	3.500 (88,9)	8.37 (212,6)	5.72 (145,3)	2.81 (71,4)	3.31 (84,1)	3.87 (98,3)	5.12 (130,0)	1.72 (43,7)	1-1/4	39 (54)	11.0 (5,0)
4 DN100	4.500 (114,3)	9.63 (245,6)	6.68 (169,7)	3.80 (96,5)	3.63 (92,2)	4.53 (115,4)	5.78 (146,8)	2.12 (53,8)	2	50 (69)	25.0 (11,3)
139.7 DN125	- (139,7)	10.50 (266,7)	7.40 (188,0)	4.46 (113,2)	4.13 (104,9)	4.90 (124,5)	7.00 (177,8)	2.09 (53,1)	2	39 (54)	29.0 (13,2)
5 DN125	5.563 (141,3)	10.50 (266,7)	7.40 (188,0)	4.46 (113,2)	4.13 (104,9)	4.90 (124,5)	7.00 (177,8)	2.09 (53,1)	2	39 (54)	29.0 (13,2)
165.1 DN150	- (165,1)	11.50 (292,1)	8.00 (203,2)	4.62 (117,4)	4.50 (114,3)	5.00 (127,0)	7.25 (184,2)	2.00 (50,8)	2	60 (82)	47.0 (21,3)
6 DN150	6.625 (168,3)	11.50 (292,1)	8.00 (203,2)	4.62 (117,4)	4.50 (114,3)	5.00 (127,0)	7.25 (184,2)	2.00 (50,8)	2	60 (82)	47.0 (21,3)
8 DN200	8.625 (219,1)	14.00 (355,6)	10.14 (257,6)	6.67 (169,4)	5.52 (140,2)	5.46 (138,7)	10.50 (266,7)	2.43 (61,7)	2	120 (164)	66.0 (30,0)
10 DN250	10.750 (273,1)	18.00 (457,2)	12.38 (314,5)	8.62 (218,9)	6.41 (162,8)	7.50 (190,5)	10.75 (273,1)	3.38 (85,9)	2	130 (178)	109.7 (49,4)
12 DN300	12.750 (323,9)	21.0 (533,4)	14.28 (362,7)	9.93 (252,2)	7.27 (184,7)	7.62 (193,5)	10.00 (254,0)	3.13 (79,5)	2	130 (178)	151.0 (68,0)

FIGURE 1
MODEL CV-1FR RISER CHECK VALVES
NOMINAL DIMENSIONS



Detail	Part	Material	Qty.
1	Body	Ductile Iron	1
2	Cover	Ductile Iron	1
3	Cover Gasket	Nitrile Rubber	1
4	Hex Cap Screw	Steel, Zinc Plated	AR
5	Clapper 2″ - 8″ (DN50-200)	Stainless Steel	1
	Clapper 10″ - 12″ (DN250-300)	Ductile Iron	

Detail	Part	Material	Qty.
6	Clapper Facing	EPDM Grade “E”	1
7	Spring	Stainless Steel	1
8	Hinge Shaft	Stainless Steel	1
9	Retaining Ring	Stainless Steel	AR
11	Retention Bolt	Stainless Steel	1
13	Retaining Disc	Stainless Steel	1

Detail	Part	Material	Qty.
14	Locknut	Stainless Steel	1
15	Adhesive	Thread Sealer	AR
16	Nameplate	Aluminum	1
17	Rivet	Steel	2
18	Spacer	Stainless Steel	1

FIGURE 2
MODEL CV-1FR RISER CHECK VALVES
ASSEMBLY

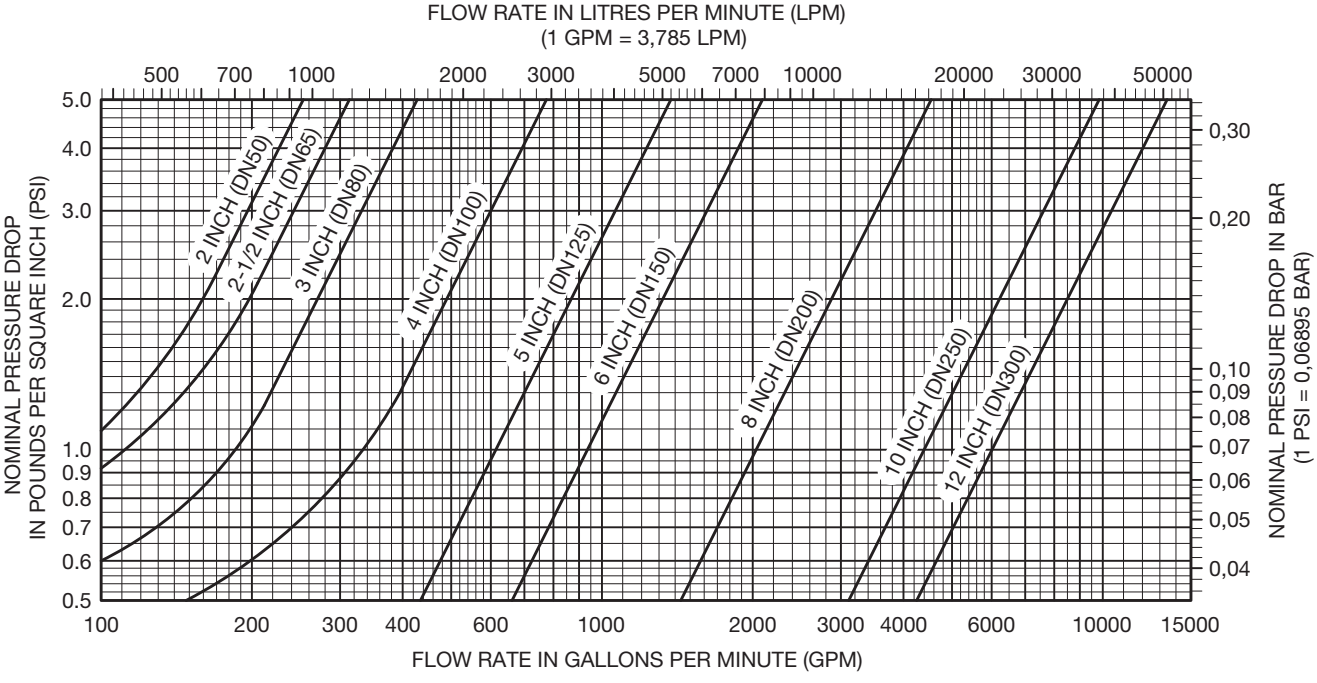
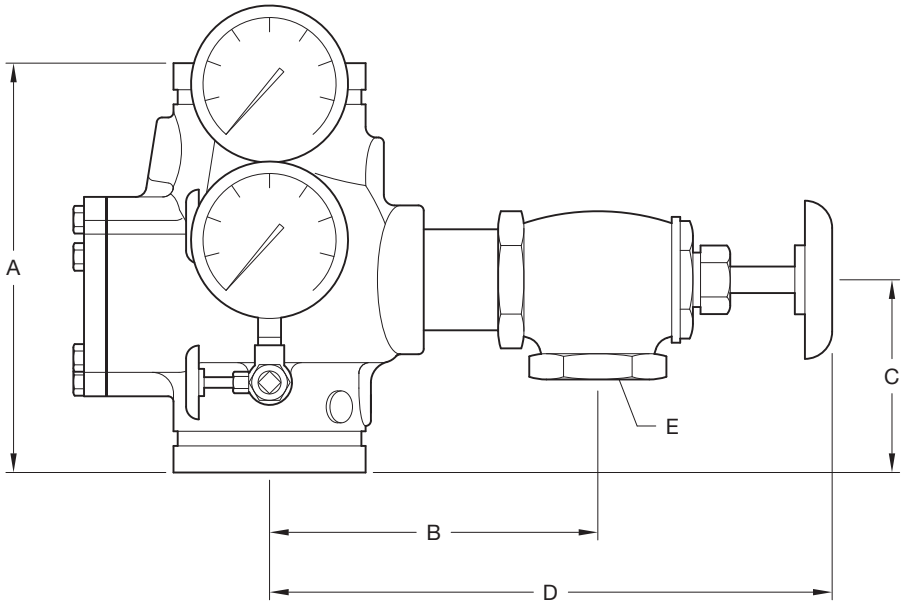


FIGURE 3
MODEL CV-1FR RISER CHECK VALVES
PRESSURE LOSS DATA



Nominal Pipe Size		Nominal Dimensions Inches (mm)				
ANSI Inches DN	O.D. Inches (mm)	A	B	C	D	E Inches NPT
2 DN50	2.375 (60,3)	6.75 (171,5)	5.87 (149,1)	3.25 (82,6)	9.52 (241,9)	1
2-1/2 DN65	2.875 (73,0)	8.00 (203,2)	6.66 (169,2)	3.87 (98,3)	10.80 (274,3)	1-1/4
76,1 DN65	– (76,1)	8.00 (203,2)	6.66 (169,2)	3.87 (98,3)	10.80 (274,3)	1-1/4
3 DN80	3.500 (88,9)	8.37 (212,6)	6.88 (174,8)	3.87 (98,3)	11.02 (279,9)	1-1/4
4 DN100	4.500 (114,3)	9.63 (244,6)	7.63 (193,7)	4.53 (115,1)	11.92 (302,7)	2
139,7 DN125	– (139,7)	10.50 (266,7)	8.13 (206,4)	4.90 (124,5)	12.42 (315,4)	2
5 DN125	5.563 (141,3)	10.50 (266,7)	8.13 (206,4)	4.90 (124,5)	12.42 (315,4)	2
165,1 DN150	– (165,1)	11.50 (292,1)	8.50 (215,8)	5.00 (127,0)	12.79 (324,8)	2
6 DN150	6.625 (168,3)	11.50 (292,1)	8.50 (215,8)	5.00 (127,0)	12.79 (324,8)	2
8 DN200	8.625 (219,1)	14.00 (355,6)	9.52 (241,7)	5.46 (138,7)	13.81 (350,7)	2
10 DN250	10.750 (273,1)	18.00 (457,2)	10.41 (264,3)	7.50 (190,5)	14.70 (373,3)	2
12 DN300	12.750 (323,9)	21.00 (533,4)	11.27 (286,1)	7.62 (193,5)	15.56 (395,2)	2

FIGURE 4
MODEL CV-1FR RISER CHECK VALVE WITH TRIM COMPONENTS
NOMINAL DIMENSIONS

P/N 59-591-1-020
2 Inch (DN50)

NO.	DESCRIPTION	QTY.	P/N
1	300 psi/ 2000 kPa Water Pressure Gauge	2	92-343-1-005
2	1/4" Gauge Test Valve	2	46-005-1-002
3	1/4" Plug	2	CH
4	1" Angle Valve	1	46-048-1-006
5	1/4" x 2" Nipple	1	CH
6	1/4" x 5" Nipple	1	CH
7	1" x 3" Nipple	1	CH

P/N 59-591-1-030
2-1/2 Inch (DN65) through 3 Inch (DN80)

NO.	DESCRIPTION	QTY.	P/N
1	300 psi/ 2000 kPa Water Pressure Gauge	2	92-343-1-005
2	1/4" Gauge Test Valve	2	46-005-1-002
3	1/4" Plug	2	CH
4	1-1/4" Angle Valve	1	46-048-1-007
5	1/4" x 2" Nipple	1	CH
6	1/4" x 5" Nipple	1	CH
7	1-1/4" x 3" Nipple	1	CH

P/N 59-591-1-080
4 Inch (DN100) through 12 Inch (DN300)

NO.	DESCRIPTION	QTY.	P/N
1	300 psi/ 2000 kPa Water Pressure Gauge	2	92-343-1-005
2	1/4" Gauge Test Valve	2	46-005-1-002
3	1/4" Plug	2	CH
4	2" Angle Valve	1	46-048-1-009
5	1/4" x 2" Nipple	1	CH
6	1/4" x 5" Nipple	1	CH
7	2" x 3" Nipple	1	CH

NOTES:
1. All Fittings and Nipples are galvanized (Standard Order).
2. CH: Common Hardware.

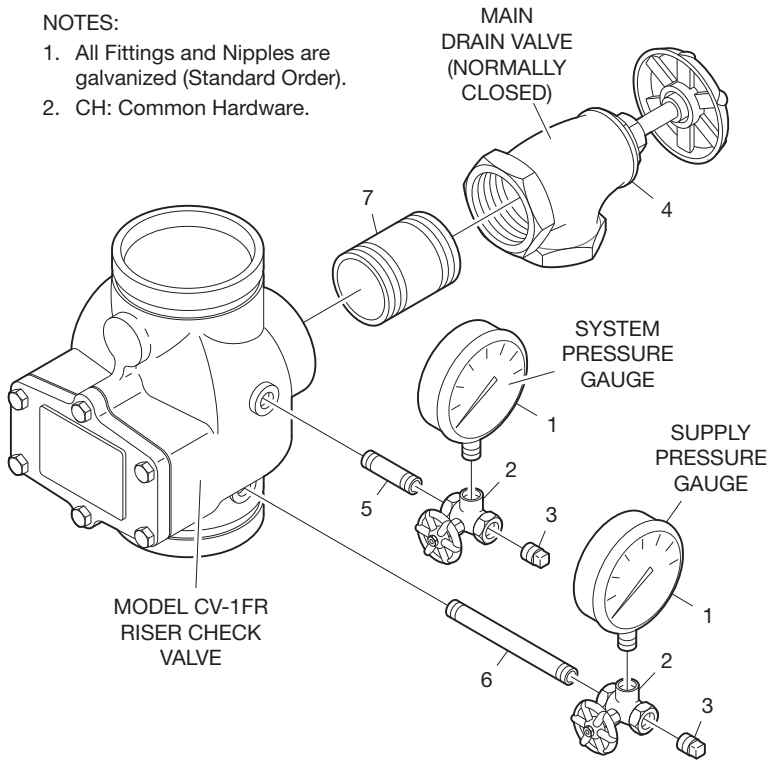
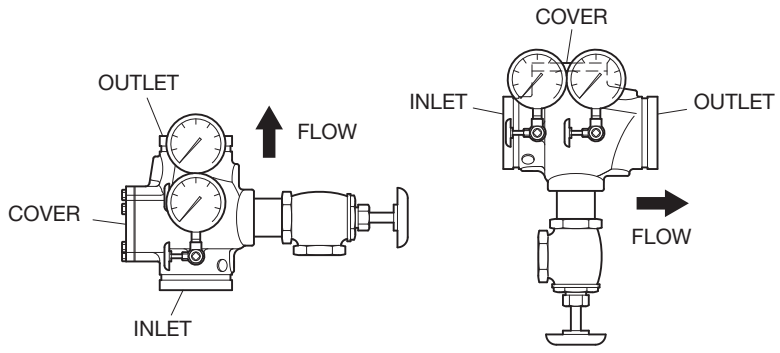


FIGURE 5
MODEL CV-1FR RISER CHECK VALVES
TRIM PARTS LIST



VERTICAL ORIENTATION **HORIZONTAL ORIENTATION**

FIGURE 6
MODEL CV-1FR RISER CHECK VALVES
INSTALLATION

TFP950
Page 6 of 6

Care and Maintenance

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

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 NATIONAL FIRE PROTECTION ASSOCIATION (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. Contact the installing contractor or product manufacturer with any questions. Any impairments must be immediately corrected.

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

For warranty terms and conditions, visit www.tyco-fire.com.

Ordering Procedure

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

Model CV-1FR Check Valves
Specify: Size and P/N (below):

2 in. (DN50) . . . . . P/N 59-590-1-020
2-1/2 in. (DN65) . . . . . P/N 59-590-1-025
76,1 mm (DN65) . . . . . P/N 59-590-1-076
3 in. (DN80) . . . . . P/N 59-590-1-030
4 in. (DN100) . . . . . P/N 59-590-1-040
139,7 mm (DN125) . . . . . P/N 59-590-1-139
5 in. (DN125) . . . . . P/N 59-590-1-050
165,1 mm (DN150) . . . . . P/N 59-590-1-165
6 in. (DN150) . . . . . P/N 59-590-1-060
8 in. (DN200) . . . . . P/N 59-590-1-080
10 in. (DN250) . . . . . P/N 59-590-1-100
12 in. (DN300) . . . . . P/N 59-590-1-120

Model CV-1FR
Riser Check Valve Trim Assembly
Specify: Size and P/N (below).

2 in. (DN50) . . . . . P/N 59-591-1-020
2-1/2 in. (DN65) . . . . . P/N 59-591-1-030
76,1 mm (DN65) . . . . . P/N 59-591-1-030
3 in. (DN80) . . . . . P/N 59-591-1-030
4 in. (DN100) . . . . . P/N 59-591-1-080
139,7 mm (DN125) . . . . . P/N 59-591-1-080
5 in. (DN125) . . . . . P/N 59-591-1-080
165,1 mm (DN150) . . . . . P/N 59-591-1-080
6 in. (DN150) . . . . . P/N 59-591-1-080
8 in. (DN200) . . . . . P/N 59-591-1-080
10 in. (DN250) . . . . . P/N 59-591-1-080
12 in. (DN300) . . . . . P/N 59-591-1-080

1400 Pennbrook Parkway, Lansdale, PA 19446 | Telephone +1-215-362-0700

tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

Model 513 (13) Riser Manifold 1-1/2 thru 6 Inch (DN40 thru DN150) For NFPA 13 Sprinkler Systems

General Description

The Figure 513 (13) Riser Manifolds described in this technical data sheet provide the necessary waterflow alarm, pressure gauge, alarm test orifice, drain, and sight glass equipment in a single assembly for use in NFPA 13 sprinkler systems as follows:

NFPA 13*

- 1-1/2 Inch (DN40)
  Male Thread x Female Thread
- 1-1/2 thru 6 Inch (DN40 thru DN150)
  Groove x Groove

*Although the Riser Manifold described in this data sheet is intended for NFPA 13 sprinkler systems, it may be used for NFPA 13D or 13R residential sprinkler systems, where a test orifice of 5.6K (80K) is acceptable.

The variety of sizes and grooved end connections allow cost effective and easy transition to check valves, control valves, and system piping. The Riser Manifolds may be installed in either the horizontal (flow switch on top) or vertical (flow going up) for both single sprinkler rises and floor control in high rises.

WARNING

The Riser Manifolds described herein must be installed and maintained 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 performance of these devices.***

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 with any questions.

Technical Data

Approvals
The Figure 513 (13) Riser Manifolds with a cover tamper switch for the waterflow alarm switch are UL Listed, ULC Listed, and FM Approved.

The Figure 513 (13) Riser Manifolds without a cover tamper switch for the waterflow alarm switch are UL Listed and FM Approved.

Maximum Working Pressure
175 psi (12,1 bar)

Test Orifice
5.6K (80K)

Assembly
The manifold body of the Figure 513 is ductile iron, whereas the manifold body of the Figure 13 is cast iron. The two assemblies are completely interchangeable in function, application, and end-to-end laying length.

Finish
Red painted.

Installation

The Riser Manifolds may be installed in either the horizontal (flow switch on top) or vertical (flow going up). The inlet of the Riser Manifold may be directly connected to a shut-off control valve.

NOTES

Where applicable pipe thread sealant is to be applied sparingly. Use of a non-hardening pipe thread sealant is recommended.

Never remove any piping component nor correct or modify any piping deficiencies without first depressurizing and draining the system.

Step 1. Install the manifold body with the flow arrow pointing in the downstream position using threaded connections and/or listed mechanical grooved connections, as applicable

Step 2. Connect the drain line, and then close the drain valve.

Step 3. Refer to Figure 3 for wiring guidance. All wiring must be performed in accordance with the Authority Having Jurisdiction and/or the National Electrical Code.

Step 4. Refer to Figure 4 for optional relief valve.

Step 5. Place the system in service by filling the system with water. When filling the system, partially open the control valve to slowly fill the system. *Filling the system slowly will help avoid damaging the waterflow alarm switch.*

After the system is fully pressurized, completely open the control valve.

Step 6. Secure all supply valves open.

NO.	DESCRIPTION	QTY.	P/N
1	1-1/2" Manifold Body, Male x Female NPT	1	N/A
	Groove x Groove	1	N/A
2	Waterflow Alarm Switch: VSR-SF with Paddle, UL/FM	1	971-096-00
	VSR-SF with Paddle and Cover Tamper Switch, ULC/FM	1	976-519-02
3	300 psi/2000 kPa Water Pressure Gauge	1	2341

NOTES:
1. Approximate weight, 11.2 lbs. (5,1 kg).
2. ULC Listed Manifolds are equipped with Cover Tamper Switches installed internal to the Waterflow Alarm Switches.
3. CH: Common Hardware

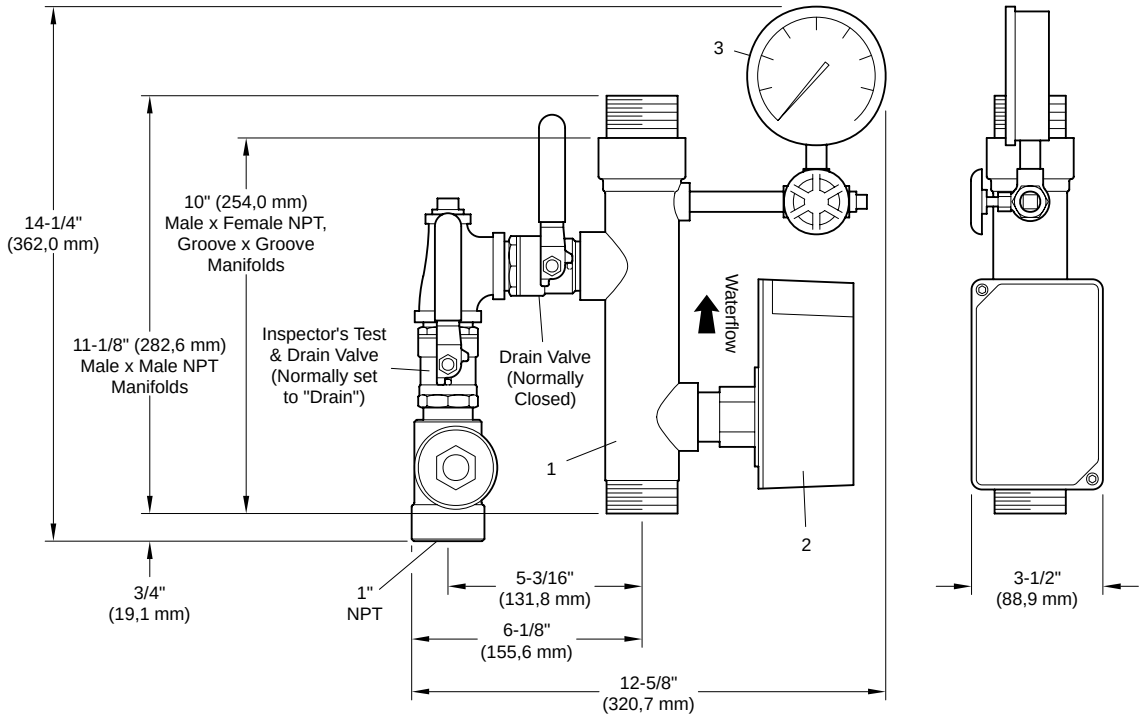


FIGURE 1
1-1/2 INCH (DN40) RISER MANIFOLD ASSEMBLY AND DIMENSIONS

2 INCH (DN50) MANIFOLD

NO.	DESCRIPTION	QTY.	P/N
1	2" Manifold Body, Groove x Groove	1	N/A
2	Waterflow Alarm Switch: VSC with Paddle, UL/FM	1	976-357-01
	VSC with Paddle and Cover Tamper Switch, ULC/FM	1	976-520-01
3	300 psi/2000 kPa Water Pressure Gauge	1	2341

4 INCH (DN100) MANIFOLD

NO.	DESCRIPTION	QTY.	P/N
1	4" Manifold Body, Groove x Groove	1	N/A
2	Waterflow Alarm Switch: VSC with Paddle, UL/FM	1	976-357-04
	VSC with Paddle and Cover Tamper Switch, ULC/FM	1	976-520-04
3	300 psi/2000 kPa Water Pressure Gauge	1	2341

6 INCH (DN150) MANIFOLD

NO.	DESCRIPTION	QTY.	P/N
1	6" Manifold Body, Groove x Groove	1	N/A
2	Waterflow Alarm Switch: VSC with Paddle, UL/FM	1	976-357-05
	VSC with Paddle and Cover Tamper Switch, ULC/FM	1	976-520-05
3	300 psi/2000 kPa Water Pressure Gauge	1	2341

2-1/2 INCH (DN65) MANIFOLD

NO.	DESCRIPTION	QTY.	P/N
1	2-1/2" Manifold Body, Groove x Groove	1	N/A
2	Waterflow Alarm Switch: VSC with Paddle, UL/FM	1	976-357-02
	VSC with Paddle and Cover Tamper Switch, ULC/FM	1	976-520-02
3	300 psi/2000 kPa Water Pressure Gauge	1	2341

Manifold Size	Nominal Installation Dimensions in Inches and (mm)							Drain Size	Weight lbs. (kg)
	A	B	C	D	E	F	G	H	
2 Inch (DN50)	16-3/4 (425,5)	13 (330,2)	9/16 (14,3)	5-3/8 (136,5)	6-3/8 (161,9)	13-1/16 (331,8)	3-1/2 (88,9)	1" NPT	13.5 (6,1)
2-1/2 Inch (DN65)	17-3/16 (436,6)	13 (330,2)	1 (25,4)	5-3/4 (146,1)	6-7/8 (174,6)	13-3/4 (349,3)	3-1/2 (88,9)	1-1/4" NPT	16.8 (7,6)
3 Inch (DN80)	17-3/16 (436,6)	13 (330,2)	1 (25,4)	6 (152,4)	7-1/8 (181,0)	14-1/4 (362,0)	3-1/2 (88,9)	1-1/4" NPT	18.7 (8,5)
4 Inch (DN100)	20-1/2 (520,7)	13 (330,2)	4-5/16 (109,5)	7-9/16 (192,1)	9-1/16 (230,2)	16-5/8 (422,3)	4-1/2 (114,3)	2" NPT	32.7 (14,8)
6 Inch (DN150)	20-1/2 (520,7)	13 (330,2)	4-5/16 (109,5)	8-1/2 (215,9)	10 (254,0)	18-1/2 (469,9)	6-5/8 (168,3)	2" NPT	41.6 (18,9)

3 INCH (DN80) MANIFOLD

NO.	DESCRIPTION	QTY.	P/N
1	3" Manifold Body, Groove x Groove	1	N/A
2	Waterflow Alarm Switch: VSC with Paddle, UL/FM	1	976-357-03
	VSC with Paddle and Cover Tamper Switch, ULC/FM	1	976-520-03
3	300 psi/2000 kPa Water Pressure Gauge	1	2341

NOTES:

1. ULC Listed Manifolds are equipped with Cover Tamper Switches installed internal to the Waterflow Alarm Switches.
2. CH: Common Hardware

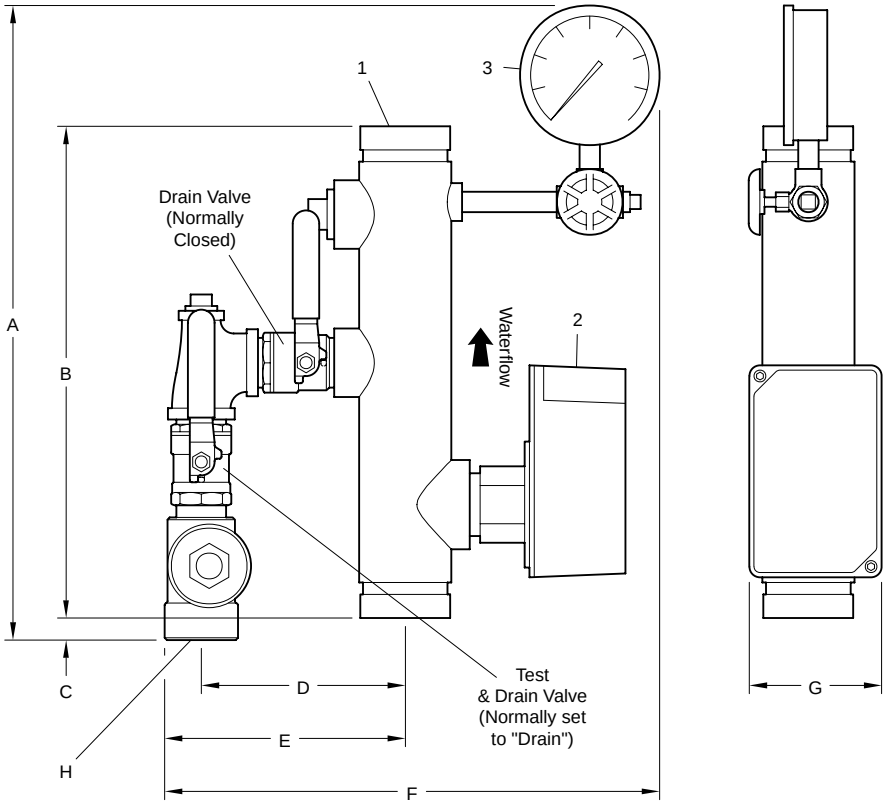
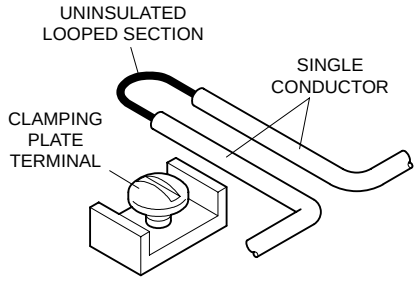


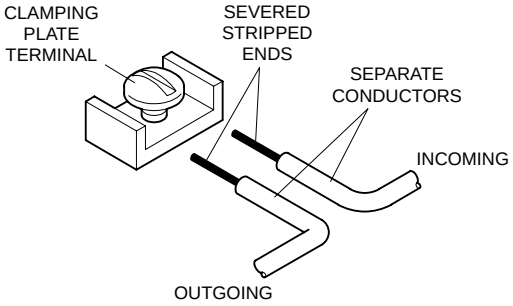
FIGURE 2
2 thru 6 INCH (DN50 thru DN150) RISER MANIFOLD ASSEMBLY AND DIMENSIONS

SWITCH TERMINAL CONNECTIONS



IMPROPER CONNECTION METHOD

CAUTION:
An uninsulated section of a single conductor is not permitted to be looped around the terminal and serve as two separate connections. The wire must be severed to serve as two separate connections, thereby providing supervision of the connection in the event that the wire becomes dislodged from the terminal.

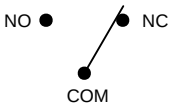


PROPER CONNECTION METHOD

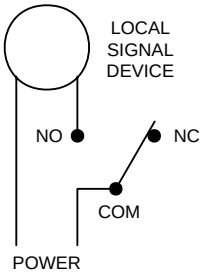
WATERFLOW SWITCH TYPICAL ELECTRICA CONNECTIONS

CONTACTS . . . . . SPDT (Form C)

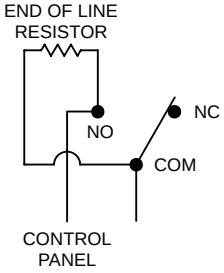
CONTACT RATING . . . . 5A @ 125 VAC
2.5A @ 30 VDC



NO FLOW
CONDITION



NON-SUPERVISED
CIRCUIT



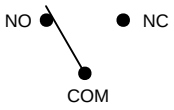
STYLE B/CLASS B
SUPERVISED CIRCUIT
(SEE NOTE)

NOTE:
For supervised circuits, see "Switch Terminal Connections" above. The Waterflow Alarm Switch has two switches, one can be used to operate a central station, proprietary or remove signaling unit, while the other contact is used to operate a local audible or visual annunciator.

COVER TAMPER SWITCH (ULC ASSEMBLIES ONLY)

CONTACTS . . . . . SPDT (Form C)

CONTACT RATING . . . . 3A @ 250 VAC
5A @ 125 VAC
1mA @ 5 VDC min.



CONTACTS SHOWN
WITH COVER IN PLACE

FIGURE 3
WIRING GUIDANCE

NO.	DESCRIPTION	QTY.	P/N
1	3/8" Copper Tubing, 2" (DN50) Manifolds	1	971-124-01
	2-1/2" (DN65) and 3" (DN80) Manifolds	1	971-124-02
	4" (DN100) and 6" (DN150) Manifolds	1	971-124-03

NO.	DESCRIPTION	QTY.	P/N
2	Pressure Relief Valve, 175 psi, Nonadjustable	1	198-066-00
3	90° Compression Fitting Fitting	2	CH
4	1" x 1/2" Reducing Hex Bushing	1	CH

CH: Common Hardware

1-1/2" (DN40) Manifold Only:
To install optional Pressure Relief Trim on a 1-1/2" (DN40) Manifold, a 1/2" NPT outlet must be provided by the installer on the system outlet piping, and a connection back to the manifold drain trim must be fabricated with installer supplied 3/8" copper tubing. Discard unused trim components.

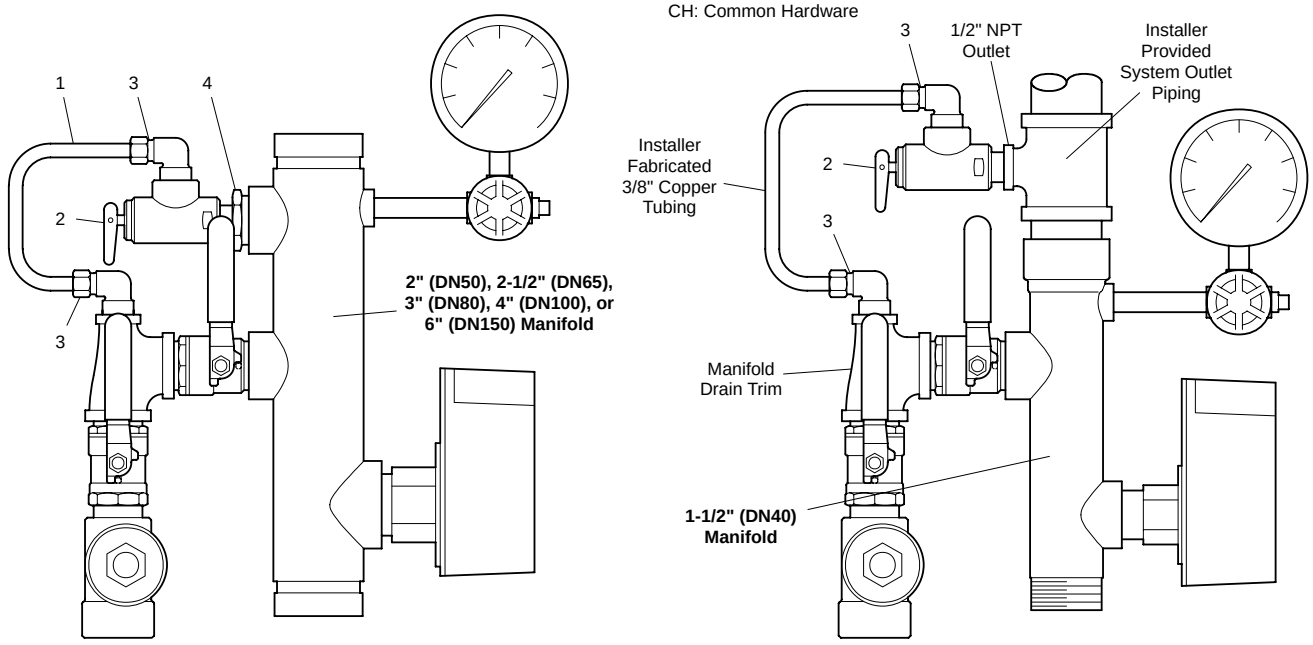


FIGURE 4
OPTIONAL PRESSURE RELIEF VALVE

Care and Maintenance

The following inspection procedure must be performed as indicated, in addition to any specific requirements of the NFPA, and any impairment must be immediately corrected.

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 National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. The installing contractor or product 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 in accordance with local requirements and/or national codes.

NOTES

No attempt is to be made to repair any Riser Manifold component in the field. Only the pressure gauge, waterflow alarm switch, or relief valve can be replaced. If any other problems are encountered the entire riser manifold must be replaced.

The alarm/flow test procedure will result in operation of the associated alarms. Consequently, notification must be given to the owner and the fire department, central station, or other signal station to which the alarms are connected, and notification must be given to the building occupants.

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

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

Alarm/Flow Test Procedure

Step 1. Place the test & drain Valve in the “test” position.

Step 2. Fully open the drain valve. Make certain that drainage water will not cause any damage or injury.

Step 3. Verify operation of associated alarms.

Step 4. Close the drain valve.

Step 5. Place the test & drain Valve in the “drain” position.

Step 6. Verify that the residual (flowing) pressure indicated by the pressure gauge is no less that originally recorded for the system when it was first installed.

Step 7. Close the drain valve.

Step 8. Verify that the static (not flowing) pressure indicated by the pressure gauge is no less that originally recorded for the system when it was first installed.

Limited Warranty

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

Riser Manifold:
Specify; Size (specify), Figure 513, (specify connection type inlet x outlet) Riser Manifold (specify - without or with) a cover tamper switch for the waterflow alarm switch, P/N (specify).

NOTES

Orders for Figure 513 may be filled with a Figure 13. The two assemblies are completely interchangeable in function, application, and end-to-end laying length.

If a ULC Listing is required, the Riser Manifold must be ordered with a cover tamper switch for the waterflow alarm switch.

UL/ULC/FM Assemblies
With Cover Tamper Switch

1-1/2 Inch (DN40)	
MT x FT	P/N 4086
1-1/2 Inch (DN40)	
MT x MT	P/N 4087
2 Inch (DN50)	
G x G	P/N 4090
2-1/2 Inch (DN65)	
G x G	P/N 4091
3 Inch (DN80)	
G x G	P/N 4092
4 Inch (DN100)	
G x G	P/N 4095
6 Inch (DN150)	
G x G	P/N 4096

UL/FM Assemblies
Without Cover Tamper Switch

1-1/2 Inch (DN40)	
MT x FT	P/N 4055
1-1/2 Inch (DN40)	
MT x MT	P/N 4056
2 Inch (DN50)	
G x G	P/N 4060
2-1/2 Inch (DN65)	
G x G	P/N 4061
3 Inch (DN80)	
G x G	P/N 4062
4 Inch (DN100)	
G x G	P/N 4065
6 Inch (DN150)	
G x G	P/N 4066

Optional Pressure Relief Valve:
Specify: Operational Pressure Relief Valve and Trim for use with (specify size) Figure 513 or 13 Series Riser Manifold, P/N (specify).

1-1/2" or 2"	P/N 4063
2-1/2" or 3"	P/N 4072
4" or 6"	P/N 4073

Replacement Parts:
Specify: (description) for use with Figure 513 or 13 Riser Manifold, P/N (Ref. Figure 1 or 2, as applicable).

tyco Fire Suppression & Building Products

Technical Services 800-381-9312 | +1-401-781-8220
www.tyco-fire.com

Model CV-1F Check Valves 2 to 12 Inch (DN50 to DN300)

General Description

The TYCO Model CV-1F Check Valve is a compact and rugged swing-type unit that allows water flow in one direction and prevents flow in the opposite direction. A resilient elastomer seal facing on the spring-loaded clapper ensures a leak-tight seal and non-sticking operation. The Model CV-1F Check Valves are designed to minimize water hammer caused by flow reversal.

The Model CV-1F Check Valve is furnished with grooved ends and can be installed using Grinnell Grooved Couplings or GRINNELL Figure 71 Flange Adapters. The Model CV-1F Check Valves have been designed with a removable cover for ease of field maintenance. These valves can be installed horizontally (with cover in the upward position) or vertically with the flow in the upward direction. Refer to Figure 4.

A Maintenance Check Valve Kit (TFP1555) is available to allow the maintenance procedure of back-flushing through the fire department connection without removing the Model CV-1F Check Valve from the pipe line.

The Model CV-1F Check Valves are a redesign for the Central Figure 590F and GRINNELL Figure 590F.

NOTICE

Never remove any piping component nor correct or modify any piping deficiencies without first de-pressurizing and draining the system. Failure to do so may result in serious personal injury, property damage, and/or impaired device performance.

The Model CV-1F Check Valves described herein must be installed and maintained in compliance with this document and with the applicable standards of the National Fire Protection Association, in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of this device.

Owners are responsible for maintaining their fire protection system and devices in proper operating condition. The installing contractor or manufacturer should be contacted with any questions.

Technical Data

Approvals
UL, C-UL, and FM

Sizes
2 to 12 Inch (DN50 to DN300)

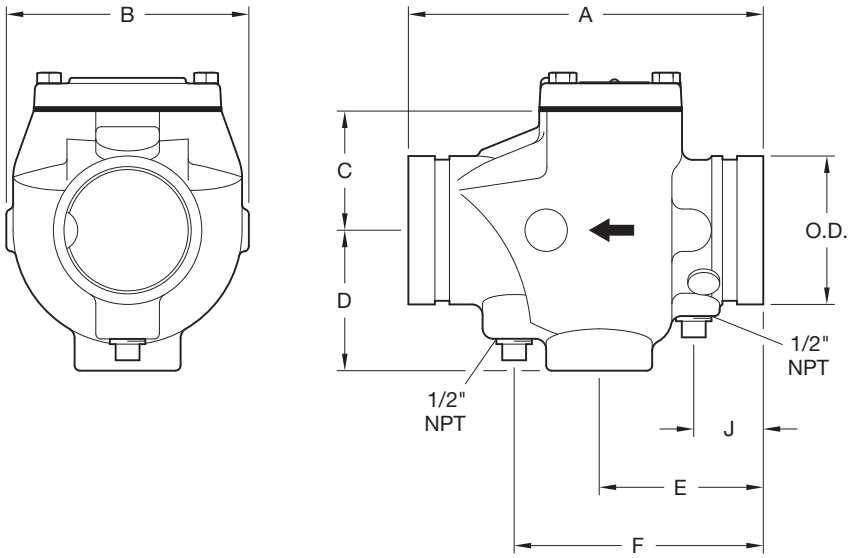
Maximum Working Pressure
300 psi (20,7 bar)

Valve Assembly Finish
Red, non-lead paint

Installation

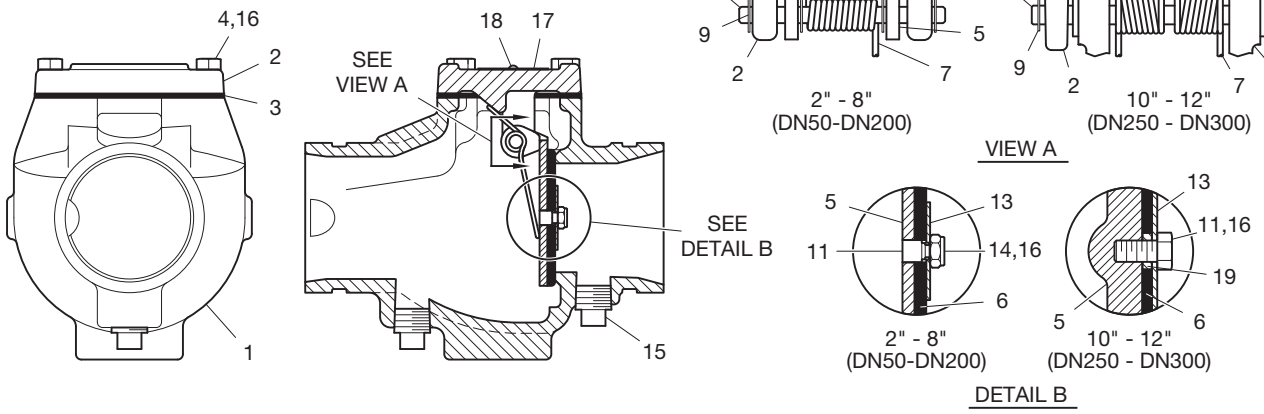
The Model CV-1F Check Valves are to be installed in accordance with the following instructions:

1. The arrow cast on the Body must point in the direction of the flow.
2. Valves installed vertically must be positioned with the flow in the upward direction.
3. Valves installed horizontally must be positioned with the Cover facing up. Refer to Figure 4.
4. Grooved end pipe couplings used with the Model CV-1F Check Valve must be installed in accordance with manufacturer's instructions.



Nominal Pipe Size		Nominal Dimensions Inches (mm)							Cover Bolt Torq. Lbs.-ft. (Nm)	Approx. Weight Lbs. (kg)
ANSI Inches DN	O.D. Inches (mm)	A	B	C	D	E	F	J		
2 DN50	2.375 (60,3)	6.75 (171,5)	4.38 (111,3)	2.55 (64,8)	2.57 (65,3)	3.25 (82,3)	4.75 (120,7)	1.62 (41,5)	18 (25)	9.0 (4,5)
2-1/2 DN65	2.875 (73,0)	8.00 (203,2)	5.80 (147,3)	3.41 (86,6)	3.40 (86,4)	3.88 (98,6)	6.00 (152,4)	1.70 (43,2)	39 (54)	10.0 (4,5)
76,1 DN65	- (76,1)	8.00 (203,2)	5.80 (147,3)	3.41 (86,6)	3.40 (86,4)	3.88 (98,6)	6.00 (152,4)	1.70 (43,2)	39 (54)	10.00 (4,5)
3 DN80	3.500 (88,9)	8.37 (212,6)	5.76 (146,3)	3.60 (91,4)	3.40 (86,4)	3.88 (98,6)	6.00 (152,4)	1.70 (43,2)	39 (54)	11.0 (5,0)
4 DN100	4.500 (114,3)	9.63 (244,6)	6.74 (171,2)	4.61 (117,1)	3.63 (92,2)	4.56 (115,1)	7.13 (181,1)	1.84 (46,7)	50 (69)	25.0 (11.3)
139.7 DN125	- (139.7)	10.50 (266,7)	7.50 (190,5)	5.29 (134,4)	4.20 (106,7)	4.90 (124,5)	7.60 (193,0)	1.90 (48,3)	39 (54)	29.0 (13.2)
5 DN125	5.563 (141,3)	10.50 (266,7)	7.50 (190,5)	5.29 (134,4)	4.20 (106,7)	4.90 (124,5)	7.60 (193,0)	1.90 (48,3)	39 (54)	29.0 (13,2)
165.1 DN150	- (165.1)	11.50 (292,1)	8.05 (204,5)	5.75 (146,1)	4.50 (114,3)	5.00 (127,0)	7.60 (193,0)	1.48 (37,6)	60 (82)	47.0 (21,3)
6 DN150	6.625 (168,3)	11.50 (292,1)	8.05 (204,5)	5.75 (146,1)	4.50 (114,3)	5.00 (127,0)	7.60 (193,0)	1.48 (37,6)	60 (82)	47.0 (21,3)
8 DN200	8.625 (219,1)	14.00 (355,6)	10.25 (260,4)	7.75 (196,9)	5.62 (142,7)	5.45 (138,4)	8.40 (213,4)	2.20 (58,9)	120 (164)	66.0 (29,9)
10 DN250	10.750 (273,1)	18.00 (457,2)	13.00 (330,2)	10.21 (259,3)	6.38 (162.1)	7.50 (190.5)	10.50 (266,7)	3.00 (76,2)	130 (178)	109.7 (49,4)
12 DN300	12.750 (323,9)	21.00 (533,4)	14.28 (362,7)	11.31 (287,2)	7.26 (184,4)	7.62 (193,5)	10.62 (269,7)	2.75 (69.9)	130 (178)	151.0 (68,0)

FIGURE 1
MODEL CV-1F CHECK VALVES
NOMINAL DIMENSIONS



Detail	Part	Material	Qty.
1	Body	Ductile Iron	1
2	Cover	Ductile Iron	1
3	Cover Gasket	Nitrile Rubber	1
4	Hex Cap Screw	Steel, Zinc Plated	AR
5	Clapper 2″ - 8″ (DN50-200)	Stainless Steel	1
	Clapper 10″-12″ (DN250-300)	Ductile Iron	

Detail	Part	Material	Qty.
6	Clapper Facing	EPDM Grade “E”	1
7	Spring	Stainless Steel	1
8	Hinge Shaft	Stainless Steel	1
9	Retaining Ring	Stainless Steel	AR
11	Retention Bolt	Stainless Steel	1
13	Retaining Disc	Stainless Steel	1

Detail	Part	Material	Qty.
14	Locknut	Stainless Steel	1
15	Plug- 1/2″-14 NPT	Cast Iron	2
16	Adhesive	Thread Sealer	AR
17	Nameplate	Aluminum	1
18	Rivet	Steel	2
19	Spacer	Stainless Steel	1

FIGURE 2
MODEL CV-1F CHECK VALVES
ASSEMBLY

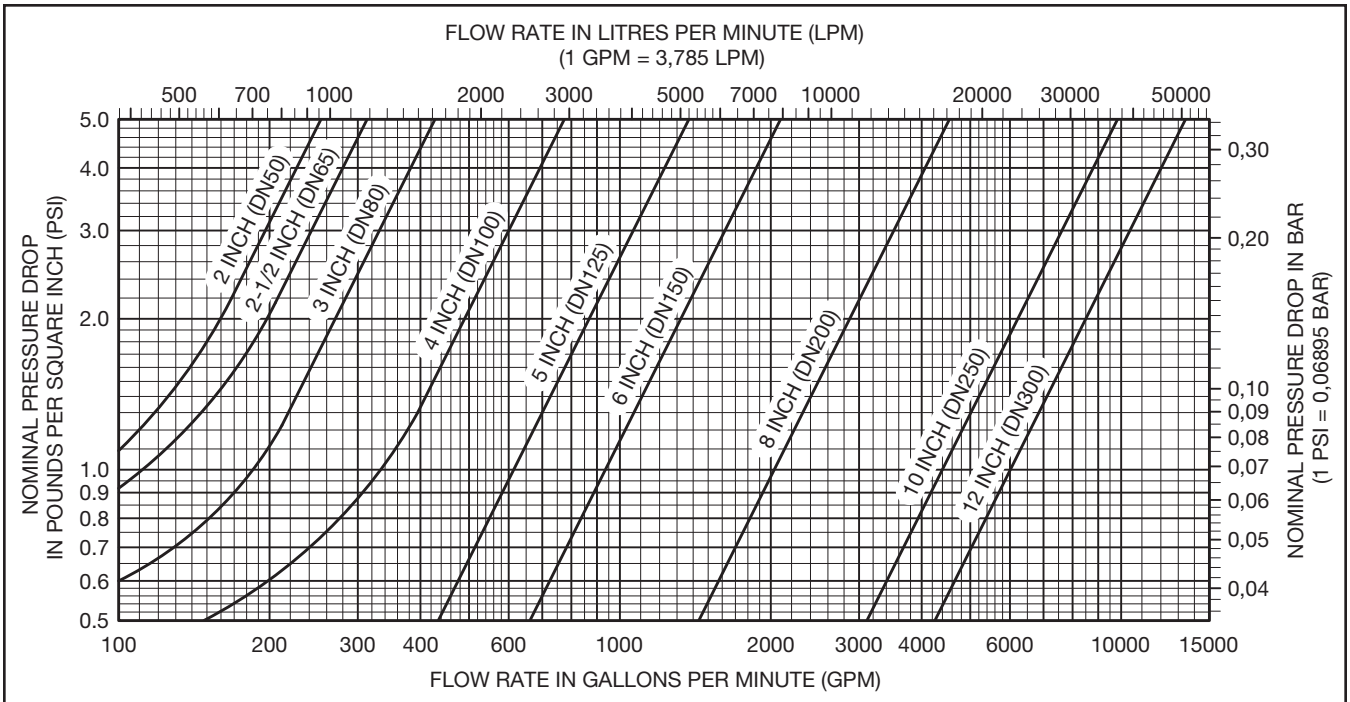


FIGURE 3
MODEL CV-1F CHECK VALVES
PRESSURE LOSS DATA

Care and Maintenance

NOTICE

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

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

Responsibility lies with owners 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 National Fire Protection Association (for example, NFPA 25), in addition to the standards of any authority having jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions. Any impairments must be immediately corrected.

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 Suppression & Building Products (TFSBP) 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 TFSBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFSBP 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 TFSBP to be defective shall be either repaired or replaced, at TFSBP's sole option. TFSBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFSBP 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 TFSBP 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 TFSBP was informed about the possibility of such damages, and in no event shall TFSBP'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 name and Part Number (P/N).

Model CV-1F Check Valves
Specify: size and P/N (below).

2″ (DN50)	P/N 59-590-0-020
2-1/2″ (DN65)	P/N 59-590-0-025
76,1 mm (DN65)	P/N 59-590-0-076
3″ (DN80)	P/N 59-590-0-030
4″ (DN100)	P/N 59-590-0-040
139,7 mm (DN125)	P/N 59-590-0-139
5″ (DN125)	P/N 59-590-0-050
165,1 mm (DN150)	P/N 59-590-0-165
6″ (DN150)	P/N 59-590-0-060
8″ (DN200)	P/N 59-590-0-080
10″ (DN250)	P/N 59-590-0-100
12″ (DN300)	P/N 59-590-0-120

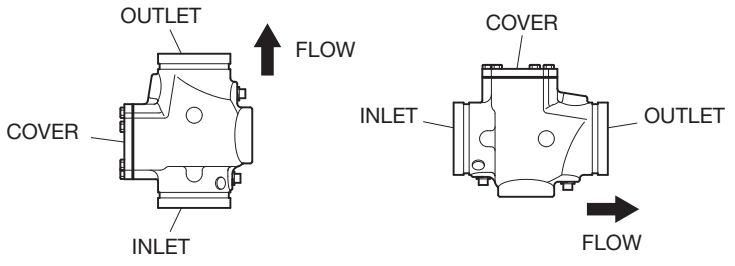


FIGURE 4
MODEL CV-1F CHECK VALVES INSTALLATION

tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

Model BFV-N Butterfly Valve Grooved End 2-1/2 Inch - 10 Inch (DN65 - DN250)

General Description

The Model BFV-N Grooved End Butterfly Valves (Ref. Figure 1) are indicating type valves designed for use in fire protection systems where a visual indication is required as to whether the valve is open or closed. They are used, for example, as system, sectional, and pump water control valves. They have cut groove inlet and outlet connections that are suitable for use with grooved end pipe couplings that are listed and approved for fire protection systems.

For applications requiring supervision of the open position of the valve, the Gear Operators for the Model BFV-N Butterfly Valves are provided with two sets of factory installed internal switches each having SPDT contacts. The supervisory switches transfer their electrical contacts when there is movement from the valve's normal open position during the first two revolutions of the handwheel.

WARNINGS

The Model BFV-N Grooved End Butterfly Valves described herein must be installed and maintained 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 performance of these devices.***

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 with any questions.

Technical Data

Model
BFV-N

Sizes: ANSI Inches / DN
2-1/2 (DN65), 3 (DN80),
4 (DN100), 5 (DN125),
6 (DN150), 8 (DN200), 10 (DN250)

Approvals
The 2-1/2 through 10 inch (DN65 - DN250) Model BFV-N Grooved End Butterfly Valves are UL and C-UL Listed and FM Approved.

In addition, the Model BFV-N Grooved End Butterfly Valves are listed by the California State Fire Marshall under Listing No. 7770-1670:100.

All laboratory listings and approvals are for indoor and outdoor use.

Maximum Working Pressure
- 2-1/2 - 8 Inch (DN65 - DN200): 300 psi (20,7) bar
- 10 Inch (DN250): 175 psi (12,0 bar)

Materials of Construction:

Body
Ductile iron conforming to ASTM A-395

Body Coating
Polyamide

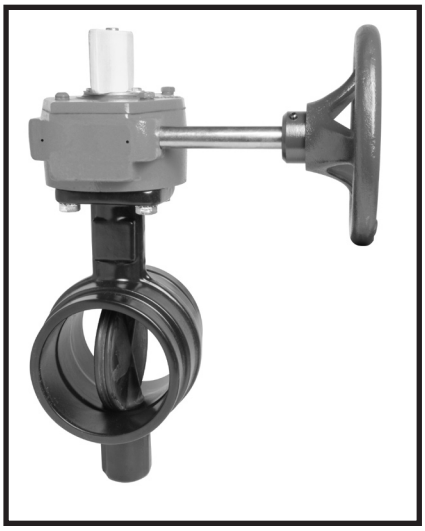
Disc
Ductile iron conforming to ASTM A-395

Disc Seal
Grade EPDM "E" encapsulated rubber conforming to ASTM D-2000

Upper & Lower Stem
Type 416 Stainless Steel conforming to ASTM 582

Lower Plug
PVC

Operator
Gear operator with iron housing



Friction Loss
The approximate friction loss, based on the Hazen Williams formula and expressed in equivalent length of pipe with C= 120, is as follows. The data is based on friction loss information collected at a typical flow rate of 15 feet per second.

- 6.9 feet of 2-1/2 inch Sch. 40 pipe for the 2-1/2 inch valve.
- 8.7 feet of 3 inch Sch. 40 pipe for the 3 inch valve.
- 4.5 feet of 4 inch Sch. 40 pipe for the 4 inch valve.
- 6.6 feet of 5 inch Sch. 40 pipe for the 5 inch valve.
- 11.1 feet of 6 inch Sch. 40 pipe for the 6 inch valve.
- 10.2 feet of 8 inch Sch. 30 pipe for the 8 inch valve.
- 12.1 feet of 10 inch Sch. 30 pipe for the 10 inch valve.

Nominal Valve Sizes	Pipe O.D.	Nominal Installation Dimensions in Inches and (mm)								Weight
		A	B	C	D	E	F	G	H	lbs. (kg)
2-1/2" DN65	2.88 (73,0)	3.85 (98,0)	11.71 (297,4)	3.25 (83,0)	5.43 (137,9)	6.00 (152,4)	7.81 (198,4)	2.50 (63,5)	0	22 (10,0)
3" DN80	3.50 (88,9)	3.85 (98,0)	12.25 (311,1)	3.54 (90,0)	5.68 (144,2)	6.00 (152,4)	7.81 (198,4)	2.50 (63,5)	0	23 (10,4)
4" DN100	4.50 (114,3)	4.56 (116,0)	13.95 (354,3)	4.35 (110,0)	6.58 (167,1)	6.00 (152,4)	7.81 (198,4)	2.50 (63,5)	0	28 (12,7)
5" DN125	5.56 (141,3)	5.86 (149,0)	14.93 (379,2)	4.84 (123,0)	7.07 (179,6)	6.00 (152,4)	7.81 (198,4)	2.50 (63,5)	0	31 (14,1)
6" DN150	6.63 (168,3)	5.86 (149,0)	17.31 (439,7)	5.93 (151,0)	8.35 (212,0)	6.00 (152,4)	7.81 (198,4)	2.50 (63,5)	0.67 (17,0)	41 (18,6)
8" DN200	8.63 (219,1)	5.26 (134,0)	19.20 (487,7)	6.87 (174,0)	9.29 (236,0)	6.00 (152,4)	7.81 (198,4)	2.50 (63,5)	5.86 (148,8)	53 (24,1)
10" DN250	10.75 (273,1)	6.29 (160,0)	25.11 (637,8)	9.17 (233,0)	11.50 (292,1)	9.00 (228,6)	7.68 (195,1)	3.00 (76,2)	7.41 (188,2)	88 (40,0)

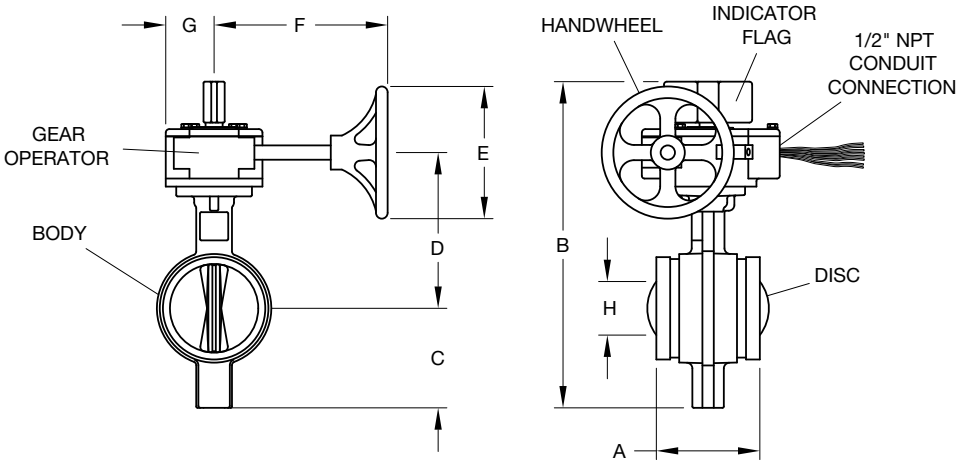


FIGURE 1
MODEL BFV-N GROOVED END BUTTERFLY VALVE
– NOMINAL DIMENSIONS –

Installation

The Model BFV-N Grooved End Butterfly Valves may be installed with flow in either direction and can be positioned either horizontally or vertically.

The grooved end pipe couplings used with the Model BFV-N must be listed or approved for fire protection service and installed in accordance with the manufacturers instructions.

The Model BFV-N Butterfly Valve may be installed with any schedule of pressure class of pipe or tubing that is listed or approved for fire protection.

As applicable, refer to Figure 2 for the internal switch wiring diagram.

Conduit and electrical connections are to be made in accordance with the authority having jurisdiction and/or the National Electrical Code. With reference to Figure 2, the "supervisory switch" is intended for connection to the supervisory circuit of a fire alarm control panel in accordance with NFPA 72. The "auxiliary switch" is intended for the unsupervised connection to auxiliary equipment in accordance with NFPA 70, National Electric Code.

NOTE

For outdoor applications with internal supervisory switches, it is recommended that wiring connections be made at a temperature above 15°F (-9°C), in order to insure sufficient flexibility of the wire lead insulation.

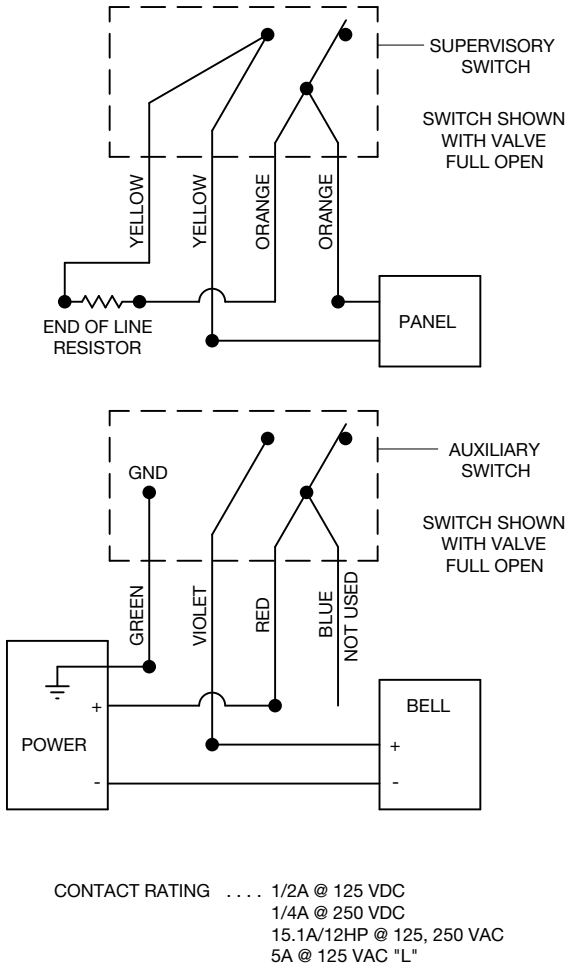


FIGURE 2
MODEL BFV-N BUTTERFLY VALVE
– INTERNAL SWITCH WIRING DIAGRAM –

Care and Maintenance

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in accordance with the applicable standards of the National Fire Protection Association (e.g., NFPA25), in addition to the standards of any authority having jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions. Any impairment must be immediately corrected.

It is recommended that automatic sprinkler systems be inspected, tested, and maintained by a qualified inspection service.

NOTE

Before closing a fire protection system control valve for maintenance or inspection work on either the valve or fire protection system which it controls, permission to shut down the affected fire protection systems must be obtained from the proper authorities and all personnel who may be affected by this decision must be notified.

Limited Warranty

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

Grooved End Butterfly Valves:
Specify: (specify inch size) Model BFV-N Grooved End Butterfly Valve with internal supervisory switches, P/N (specify).

Valve Size	Valve Part Number
2-1/2	59-300-F-025N
3	59-300-F-030N
4	59-300-F-040N
5	59-300-F-050N
6	59-300-F-060N
8	59-300-F-080N
10	59-300-F-100N

ADJUSTABLE NOZZLES

For use on Class A and B fires. Commonly used on hose assemblies.

STANDARD EQUIPMENT: Cast Brass Satin Finished nozzle with adjustable Fog, Straight Stream and Shut-Off features.

3460 Series

U/L LISTED

Without Rubber Bumper	
Size	Figure No.
1 1/2"	*3460

Optional Finishes	
Use suffix	For Finish
PB	Pol. Brass
RC	Rgh. Chrome
PC	Pol. Chrome

With Rubber Bumper	
Size	Figure No.
1"	3462
1 1/2"	*3463
2 1/2"	3464

3463 Series

U/L LISTED

SPECIFY: Figure No. - Size - Finish - Thread

ADJUSTABLE "ALL-FOG" NOZZLES FOR ELECTRICAL APPLICATIONS

For use on Class A, B, and C fires and in electrical hazard areas at distances greater than 10 feet, and when voltage level is under 250,000 volts. Adjustable thru varying fog patterns to shut-off. No Straight-stream feature.

3467 Series

STANDARD EQUIPMENT: Red Polycarbonate Plastic Nozzle with Rubber Bumper.

Size	Figure No.
1 1/2"	3467

THREADS AVAILABLE NYT,NST,NPSH

SPECIFY THREAD

STANDARD EQUIPMENT: Cast Brass Satin Finish with Rubber Bumper.

Size	Figure No.
1 1/2	3470
2 1/2	3471

U/L LISTED

Optional Finishes	
Use suffix	For Finish
PB	Pol. Brass
RC	Rgh. Chrome
PC	Pol. Chrome

SPECIFY THREAD

3470 Series

POWER FOG NOZZLE

3473 Series

SPECIFY THREAD

For use on Class A and B fires.Varying fog patterns, adjusts from full cone fog to straight stream. Quick shut-off handle for positive control of water flow. Constant flow maintained at 100 P.S.I. regardless of adjustment.

STANDARD EQUIPMENT: Polished Brass Nozzle with all position indicator stamped on sleeve.

Size	Figure No.
1 1/2	3473
2 1/2	3474

Optional Finishes	
Use suffix	For Finish
PC	Pol. Chr.

POLYCARBONATE FOG NOZZLE

3478 Series

SPECIFY THREAD

For Use on Class A & B Fires. Has adjustable fog, straight stream and shut-off features.

STANDARD EQUIPMENT: Red Polycarbonate Plastic fog Nozzle with Rubber Bumper.

Size	Figure No.
1"	3477
1 1/2"	3478
2 1/2"	3479

THREADS AVAILABLE NYT,NST,NPSH

1 1/2" X 1 1/2" HOSE RACK ASSEMBLY

3000-3100 Series

Series 3000 and 3100 Hose Rack Assemblies permit one man operation and provide immediate means of fire control. These units are capable of delivering the nationally recognized standard of 100 GPM at 65 P.S.I. at the nozzle and are rated for Class II Service under NFPA/FEMA Class of Service.

STANDARD EQUIPMENT:

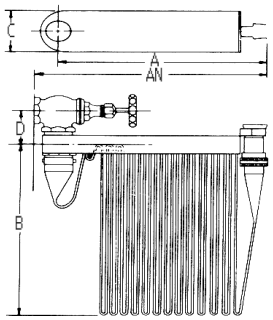
No. 3401- 1 1/2" Single Jacket Lined Hose
No. 3440- 1 1/2" Cast Brass Coupling
No. 3460- 1 1/2" Industrial Fog Nozzle U/L
No. 5040- 1 1/2" Cast Brass Angle Valve U/L
No. 5730- 1 1/2" Cadmium Plated Escutcheon
No. 3351- Red Enamel Pin Rack U/L
No. 3365- 1 1/2" Cast Brass Nipple

Figure No.	Hose Length	Hose Diameter	Hose Type	Valve Size	Dimensions				
					A	B	C	D	AN
Basic Unit As Regularly Furnished (above)									
3005	50'	1 1/2"	POLY	1 1/2"	17 7/8	23	4 1/8	3 7/8	19 3/4
3007	75'	1 1/2"	LINED	1 1/2"	17 7/8	23	4 1/8	3 7/8	19 3/4
3010	100'	1 1/2"	HOSE	1 1/2"	17 7/8	25	4 1/8	3 7/8	19 3/4

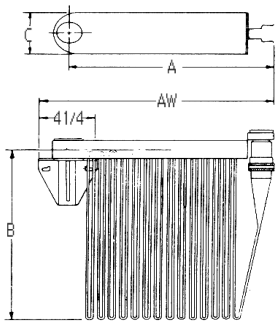
Special order lengths available upon request.

Basic Unit with Red Enamel Rack, Chrome Plated Brass Fittings and Chrome Plated Rough Brass Valve									
3105	50'	1 1/2"	POLY	1 1/2"	17 7/8	23	4 1/8	3 7/8	19 3/4
3107	75'	1 1/2"	LINED	1 1/2"	17 7/8	23	4 1/8	3 7/8	19 3/4
3110	100'	1 1/2"	HOSE	1 1/2"	17 7/8	25	4 1/8	3 7/8	19 3/4

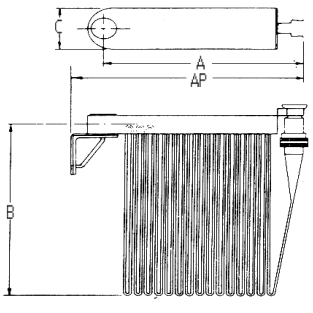
Special order lengths available upon request.



STYLE "N"



STYLE "W"



STYLE "P"

FEMA/NFPA CLASS OF SERVICE

Class 1 - Fire Service Only

Class 2 - Occupant Use

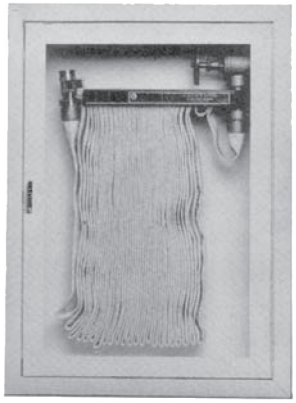
Class 3 - Fire Service or Occupant Use

NOTE

When specifying rack units consider NFPA Phamphlet No. 14 suggests and recommends the use of lined hose in lengths not exceeding 100' (30.0M) for interior hose cabinets.

1000 Series Cabinets
Fire Hose Cabinets

Models 1000-1018



Ordering Options

Optional Door & Frame Materials:

☐ **AL** - Clear Anodized Aluminum
☐ **SS** - No. 4 304 Stainless Steel

Door Style:

☐ **A** - Full Panel
☐ **D** - Horizontal Duo Panel
☐ **DV** - Vertical Duo Panel
☐ **E** - Solid Panel

Door Glazing:

☐ Clear Acrylic
☐ **T** - Clear Tempered Glass
☐ **S** - Laminated Safety Glass
☐ **W** - Clear Wire Glass w/ Safety Film

Recessed Flange (Trimless Cabinets):

☐ **WB** - 5/8" Drywall Bead Flange
☐ **PW** - 3/4" Plaster Flange

Additional Options:

☐ **FR** - Fire-rated Tub
☐ **1836** - Breakable Cylinder Lock
☐ Decal/Die Cut Lettering _____ (Specify)

Croker Division
Fire-End & Croker Corporation
7 Westchester Plaza
Elmsford, NY 10523

1-800-759-FIRE
info@croker.com
www.croker.com

Application

1000 Series cabinets will accommodate a 1 ½" fire hose rack assembly and up to a 5 lb. ABC dry chemical fire extinguisher.

Standard Features

- 20 gauge cold rolled steel door, frame, and tub with a white powder-coat suitable as a finish or primer coat. Flush doors with ⅝" door stop are attached by a 180° continuous hinge and equipped with a zinc-plated pull handle and roller catch. Surface mounted models have square edge trim. Trimless models are designed with a ⅝" recessed flange for drywall installation (WB), or ¾" recessed flange for plaster or stucco wall (PW). 1 ¾" face trim on frame and 1 ¼" trim on doors with glazing. Full and duo panel doors come standard with a clear acrylic glazing (plexiglass).
- Hardware: Includes Model 1834 pull handle with (2) screws, roller catch with (2) screws, glass clips with set screws.
- Knockouts: Standard on trimless, recessed, and semi-recessed models. Knockout locations must be specified on surface mounted cabinets. Knockouts are not available on fire-rated or stainless steel tubs.

Optional Features

- **AL** 18 gauge No. 180 clear satin anodized aluminum door and frame. Surface mounted models have square edge trim and clear anodized aluminum tubs. Trimless models have a tub constructed of 20 gauge cold rolled steel with a silver powder-coated finish. Rolled edge aluminum trim is formed of extrusions.
- **SS** 20 gauge type 304 No. 4 stainless steel door and frame. Surface mounted models have rolled edge trim and stainless steel tubs with a galvanized back panel. Trimless models have a tub constructed of 20 gauge cold rolled steel with a silver powder-coated finish.
- **FR** Fire-Rated 20 gauge steel tub with white powder-coat, insulated with Firespan™ 90 by Thermafiber®, a UL-Listed, inorganic, mineral wool fiber insulation with high recycled content, attached to the exterior of the tub and forms a flange to cover cut edges of wallboard material. These cabinets have been tested by Underwriters Laboratories® to maintain one and two-hour fire-rated wall barriers in accordance with ANSI/UL-1479, ASTM E814 and ULC/Can S115 for membrane and penetration firestops. Installation instructions must be strictly adhered to in order to obtain the fire rating. This option is not available for surface mounted models.
- Cabinet Options & Accessories - Refer to this section of the Croker catalog for all available cabinet options and accessories, including custom powder coat finishes and glazings, decals and die-cut lettering, etched and engraved lettering, locks, alarms, and more!

⚠ **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov

1000 Series Cabinets
Fire Hose Cabinets

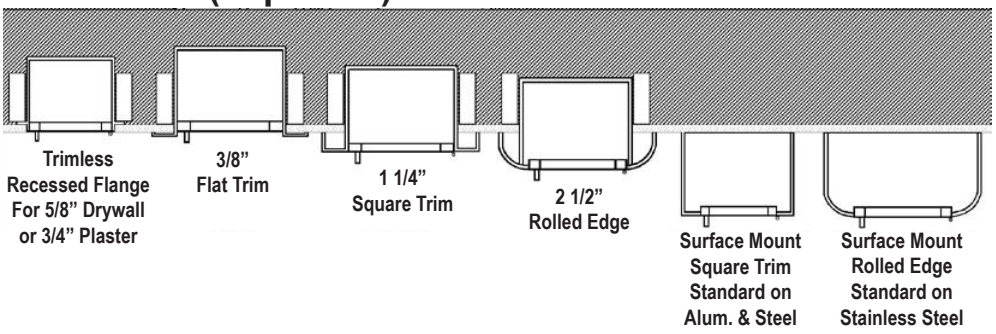
Models 1000-1018

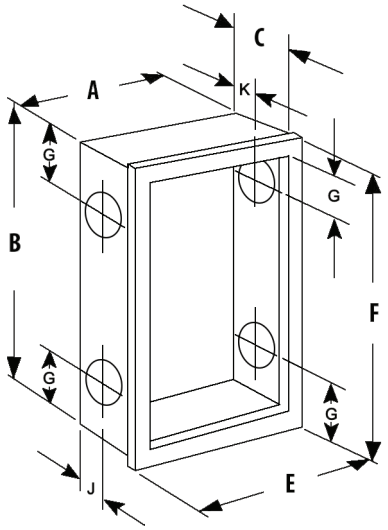
Available Models & Dimensions

Model	Trim Style	Trim Depth	Hose Capacity	Inside Box Dimensions A	B	C	Frame O.D. E	F	Knockout Locations J	G	K	Wall Opening Non-rated Width	Height	Depth	Wall Opening Fire-rated Width	Height	Depth
☐ 1000	Recessed	3/8	75'	24	30	6	27 3/8	33 3/8	2 1/2	4	2 1/2	25	31	5 7/8	26 5/16	32 5/16	6 15/16
☐ 1001	Semi-recessed	1 1/4	75'	24	30	6	27 3/8	33 3/8	2 1/2	4	2 1/2	25	31	4 7/8	26 5/16	32 5/16	5 15/16
☐ 1002	Semi-recessed	2 1/2	75'	24	30	6	27 3/8	33 3/8	2 1/2	4	2 1/2	25	31	3 5/8*	26 5/16	32 5/16	4 11/16*
☐ 1006	Trimless	-----	75'	24	30	6	26 1/2	32 1/2	2 1/2	4	2 1/2	25	31	6 1/8	26 5/16	32 5/16	6 11/16
☐ 1008	Surface	-----	75'	27 3/16	33 3/16	6 1/2	27 3/8	33 3/8	**	**	**	-----	-----	-----	-----	-----	-----
☐ 1010	Recessed	3/8	100'	24	34 3/4	6	27 3/8	38 1/8	2 1/2	4	2 1/2	25	35 3/4	5 7/8	26 5/16	37 1/16	6 15/16
☐ 1011	Semi-recessed	1 1/4	100'	24	34 3/4	6	27 3/8	38 1/8	2 1/2	4	2 1/2	25	35 3/4	4 7/8	26 5/16	37 1/16	5 15/16
☐ 1012	Semi-recessed	2 1/2	100'	24	34 3/4	6	27 3/8	38 1/8	2 1/2	4	2 1/2	25	35 3/4	3 5/8*	26 5/16	37 1/16	4 11/16*
☐ 1016	Trimless	-----	100'	24	34 3/4	6	26 1/2	36 1/4	2 1/2	4	2 1/2	25	35 3/4	6 1/8	26 5/16	37 1/16	6 11/16
☐ 1018	Surface	-----	100'	27 3/16	37 15/16	6 1/2	27 3/8	38 1/8	**	**	**	-----	-----	-----	-----	-----	-----

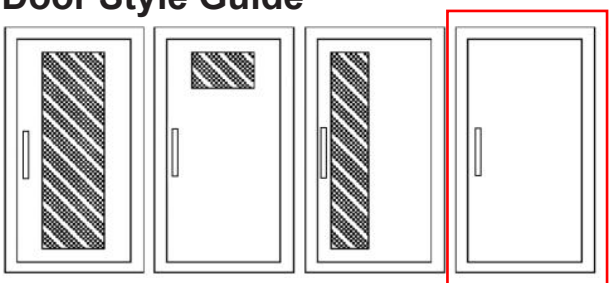
ALL DIMENSIONS ARE IN INCHES. HOSE CAPACITY BASED ON 3401 RACK HOSE. **KNOCKOUTS ARE NOT PROVIDED ON SURFACE MOUNTED CABINETS UNLESS SPECIFIED. KNOCKOUTS ARE NOT AVAILABLE ON STAINLESS STEEL OR FIRE-RATED TUBS. *ADD 5/8" TO DEPTH OF WALL OPENING REQUIRED FOR CABINETS WITH ALUMINUM FRAMES.

Trim Guide (Top View)





Door Style Guide



Croker Division
Fire-End & Croker Corporation
7 Westchester Plaza
Elmsford, NY 10523

1-800-759-FIRE
info@croker.com
www.croker.com

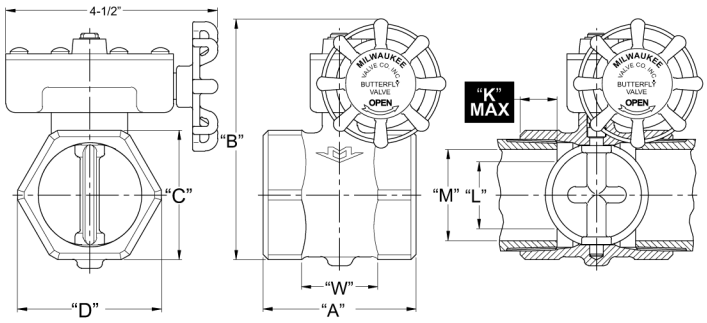
⚠ **WARNING:** Cancer and Reproductive Harm - www.P65Warnings.ca.gov

INDOOR/OUTDOOR

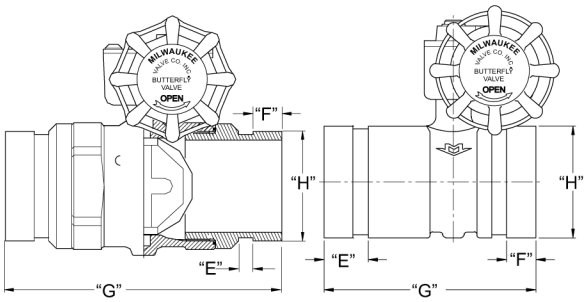
FOR ELEVATOR SPRINKLER

butterball® BUTTERFLY VALVES

VALVES LESS SUPERVISORY TAMPER SWITCH ASSEMBLY



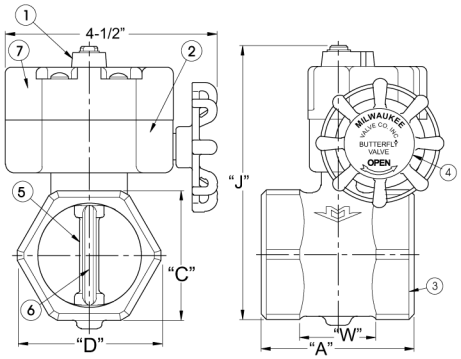
BB-SC100 (Threaded Ends)
Sizes 1", 1-1/4", 1-1/2", 2",2-1/2"



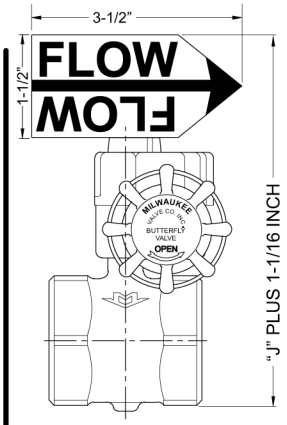
BBVSC100
3 piece with
Grooved Ends
Size 2"

BBVSC100
Uni-body with
Grooved Ends
Size 2-1/2"

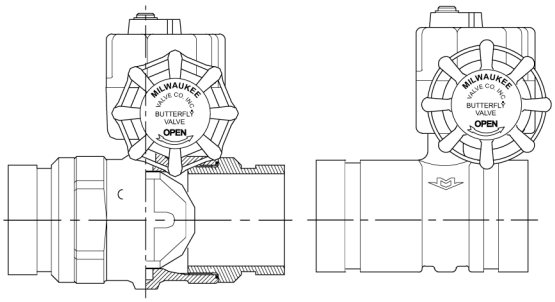
VALVES WITH SUPERVISORY TAMPER SWITCH ASSEMBLY



THREADED ENDS
BB-SCS02



NYC INDICATOR
(Available on both switched and non-switched models.)



BBVSCS02
3 piece with
Grooved Ends
Size 2"

BBVSCS02
Uni-body with
Grooved Ends
Size 2-1/2"

ALL DIMENSIONS-INCHES

	Threaded				Grooved		
SIZE	**1'**	**1-1/4"**	**1-1/2"**	**2"**	**SIZE**	**2"**	**2-1/2"**
A	2-1/8	2-5/8	2-7/8	3-1/4	A	-	4-1/8
B	3-15/16	4-9/32	4-1/2	5	B	5	5-13/32
C	1-9/16	1-15/16	2-3/16	2-3/4	C	2-3/4	3-3/16
D	1-23/32	2-7/64	2-3/8	3-1/16	D	3-1/16	3-1/2
J	4-15/16	5-1/8	5-19/32	6-1/8	E	5/8	15/16
K	.66	.73	.73	.79	F	5/16	5/8
L	.83	.90	.99	1.41	G	6	4-1/2
M-40	1.05	1.38	1.61	2.07	H	2-3/8	2-7/8
M-80	.96	1.28	1.50	1.94	J	6-1/8	6-1/4
N-40	2.25	2	2.5	2.25	K	.79	1.18
W	1-1/8	1-1/4	1-13/32	1-11/16	L	1.41	1.29
					M-40	2.07	2.47
					M-80	1.94	2.32
					N-40	2.25	10
					W	-	1-3/4

M-40 ARE DIMENSIONS USING SCHEDULE 40 PIPE
M-80 ARE DIMENSIONS USING SCHEDULE 80 PIPE
N-40 IS FLOW RESISTANCE EXPRESSEDIN EQUIVALENT LENGTH OF SCHEDULE 40 PIPE
W IS THE WRENCH MAKE-UP LENGTH

MATERIAL LIST

NO.	PART	MATERIAL	SPECIFICATION
1	Indicator	Sintered Iron	F0008P
2	Housing	Bronze	ASTM 584
3	Body	Bronze	ASTM 584
4	Handle	Brass	
5	Disc	Stainless Steel	Type 304
6	Disc Seal	EPDM Elastomer	
7	Switch Housing	Die Cast Aluminum	

POTTER
The Symbol of Protection

VSR-S

Vane Type Waterflow Alarm Switch With Retard

Features

FOR ELEVATOR SPRINKLER

- Assembled in USA
- 0-90 second field replaceable time delay retard
- Easy to read retard time delay adjustment knob
- Fits 1" to 2" CPVC, copper, brass, or iron pipe
- Comes with all necessary paddles
- Two SPDT (form C) contacts
- Weatherproof
- Easy to read wire terminal designations
- 5 year warranty

⚠ CAUTION

Waterflow switches that are monitoring wet pipe sprinkler systems shall not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems. Waterflow switches used for this application may result in unintended discharges caused by surges, trapped air, or short retard times.

Important: This document contains important information on the installation and operation of the VSR-S waterflow switches. Please read all instructions carefully before beginning installation. A copy of this document is required by NFPA 72 to be maintained on site.

Description

The Model VSR-S is a vane type waterflow switch for use on wet sprinkler systems that use 1" (25mm), 1¼" (32mm), 1½" (38mm) or 2" (50mm) pipe size. The unit may also be used as a sectional waterflow detector on large systems.

The unit contains two single pole double throw snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 gallons per minute (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

Enclosure

The VSR-S switches and retard device are enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin number 5401103 for installation instructions of this switch.

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

Technical Specifications

Service Pressure	300 PSI (20,68 BAR) - UL
Flow Required for Alarm	10 GPM (38 LPM) To ensure minimum flow of 10 gpm, a minimum pressure is required at all sprinklers with a k-factor of 3 or less. K-3: 10 PSI K-2.8: 12 PSI
Maximum Surge	18 FPS (5,5 m/s)
Enclosure	Die-cast, red powdercoat finish
Contact Ratings	Two sets of SPDT (Form C) 10.0 Amps at 125/250VAC 2.0 Amps at 30VDC Resistive 10 mAmps min. at 24VDC
Conduit Entrances	Two 1/2" conduit connections provided. Individual switch compartments suitable for dissimilar voltages.
Usage	Listed plastic, copper, schedule 40 iron pipe and unlisted riser assemblies approved by Potter . Fits pipe sizes - 1", 1¼", 1½" and 2" ***Note:*** 12 paddles are furnished with each unit, one for each pipe size of threaded and sweat TEE, one for 1" CPVC, one for 1" CPVC (Central), one for 1" threaded Nibco CPVC, and one for 1½" threaded (Japan).
Environmental Specifications	• NEMA 4/IP65 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting. • Temperature Range: 40°F - 120°F, (4.5°C - 49°C) - UL
Service Use	Automatic Sprinkler NFPA-13 One or two family dwelling NFPA-13D Residential occupancy up to four stories NFPA-13R National Fire Alarm Code NFPA-72

*Specifications subject to change without notice.

VSR-S

Vane Type Waterflow Alarm Switch With Retard

Installation

These devices may be mounted in horizontal or vertical pipe. On horizontal pipe they should be installed on the top side of the pipe where they will be accessible. The units should not be installed within 6" (15cm) of a fitting which changes the direction of the waterflow or within 24" of a valve or drain. Select the proper paddle for the pipe size and type of TEE used see Fig. 2 for instructions on changing paddle. The unit has a 1" NPT bushing for threading into a TEE. See Fig. 1 for proper TEE size, type and installation. Use no more than three wraps of teflon tape.

Screw the device into the TEE fitting as shown in Fig. 1. Care must be taken to properly orient the device for the direction of waterflow.

The vane must not rub the inside of the TEE or bind in any way. The stem should move freely when operated by hand.

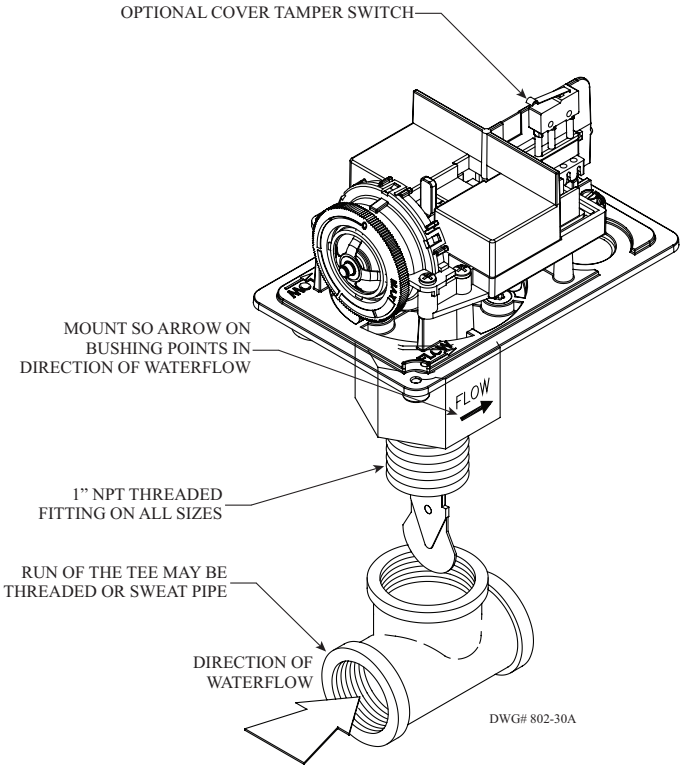
The device can also be used in copper or plastic pipe installations with the proper adapters so that the specified TEE fitting may be installed on the pipe run.

Note: Do not leave cover off for an extended period of time.

⚠ WARNING

Do not trim the paddle. Failure to follow these instructions may prevent the device from operating and will void the warranty. Do not obstruct or otherwise prevent the trip stem of the flow switch from moving when water flows as this could damage the flow switch and prevent an alarm. If an alarm is not desired, a Flowswitch Bypass Switch should be used (refer to Potter data sheet 5401554), or a qualified technician should disable the alarm system.

Fig 1

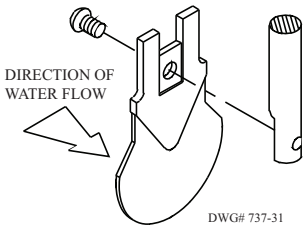


Retard Adjustment

The delay can be adjusted by rotating the retard adjustment knob from 0 to the max setting (60-90 seconds). The time delay should be set at the minimum required to prevent false alarms.

Paddle Selection

Fig 2



⚠ WARNING

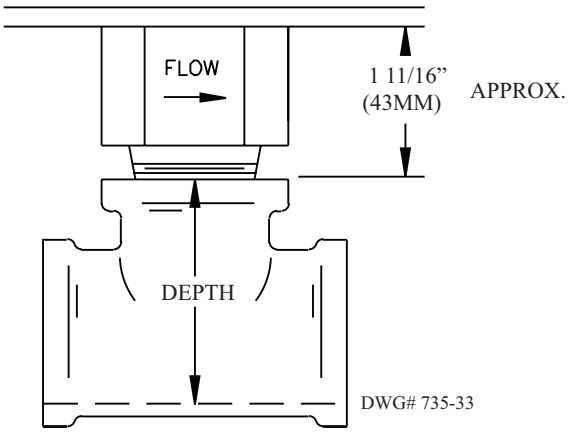
There are 12 paddles furnished with each unit. One for each size of threaded, sweat or plastic TEE as described in Fig. 3. These paddles have raised lettering that shows the pipe size and type of TEE that they are to be used with. The proper paddle must be used. The paddle must be properly attached (see drawing) and the screw that holds the paddle must be securely tightened. Do not trim the paddle.

Note: For National Fire Products risers, use paddle marked SWEAT for corresponding size riser.

TEE Specifications

Screw the fitting into the TEE fitting as shown in Fig. 3.

Fig 3



The depth to the inside bottom of the TEE should have the following dimensions:

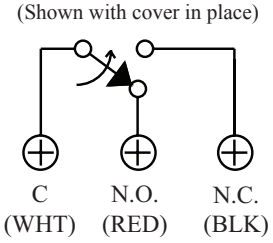
Approximate Depth Requirement			
Tee Size	Threaded	Sweat	CPVC
1" x 1" x 1"	2 1/16"	1 3/4"	2 7/16"
1 1/4" x 1 1/4" x 1"	2 7/16"	2 7/16"	N/A
1 1/2" x 1 1/2" x 1"	2 11/16"	2 1/4"	N/A
2" x 2" x 1"	3 3/16"	2 3/4"	N/A

NOTICE

Use only factory TEE's with a 1" NPT bull. Threaded bushings, reducing bushings, mechanical TEE's and weld-o-lets are not allowed unless they comply with the dimensions listed in the chart in Fig. 3 and have been factory approved by Potter. Apply teflon tape to the 1" NPT fitting. Do not use more than three wraps of teflon tape. Do not use any other type of sealant.

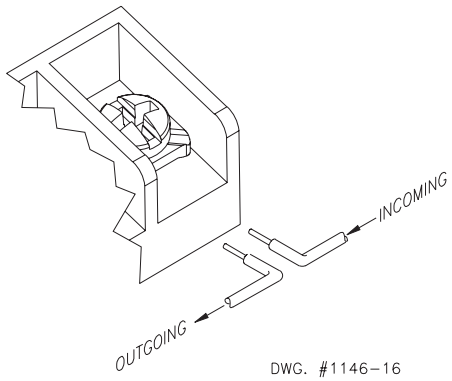
Cover Tamper Switch Wiring

Fig 4



Switch Terminal Connections Clamping Plate Terminal

Fig 5



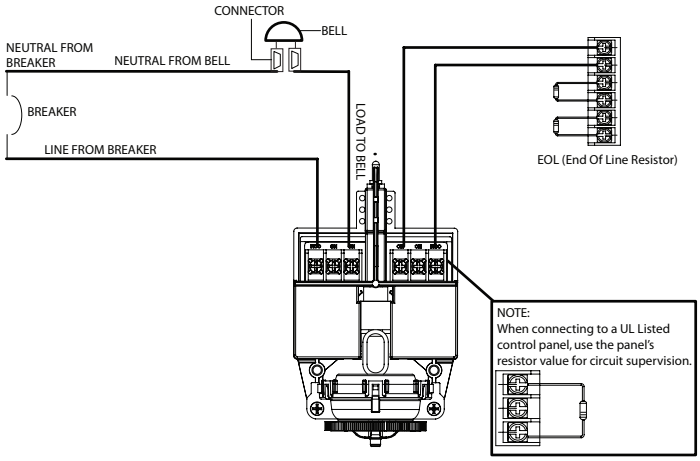
WARNING

An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render the device inoperable risking severe property damage and loss of life.

Do not strip wire beyond 3/8" of length or expose an uninsulated conductor beyond the edge of the terminal block. When using stranded wire, capture all strands under the clamping plate.

Typical Electrical Connections

Fig 6



⚠ CAUTION

The VSR-S does not require power to operate. Do not connect AC power directly to the terminals as this will damage the switch.

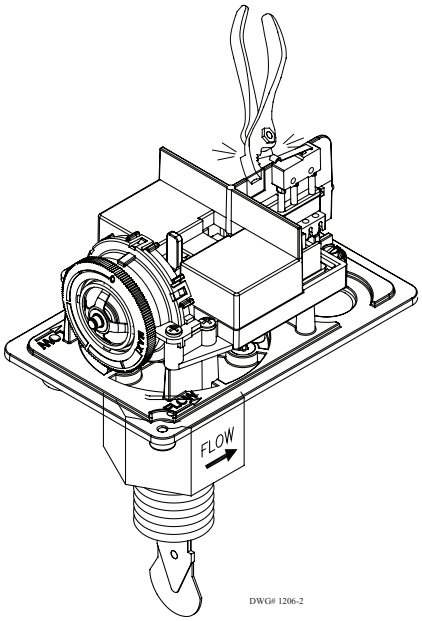
The terminals are for switching power to an indicating appliance such as a bell or strobe. Similar to how a light switch is used to switch power to a light. The terminals can also be used to connect to a fire/security panel.

Notes:

1. The Model VSR-S has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. For supervised circuits, see "Switch Terminal Connections Clamping Plate Terminal" drawing and warning note (Fig. 5).

Fig 7

Break out thin section of cover when wiring both switches from one conduit entrance.



Testing

The frequency of inspection and testing for the Model VSR-S and its associated protective monitoring system should be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

If provided, the inspector's test valve shall always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR-S is not recommended or advisable.

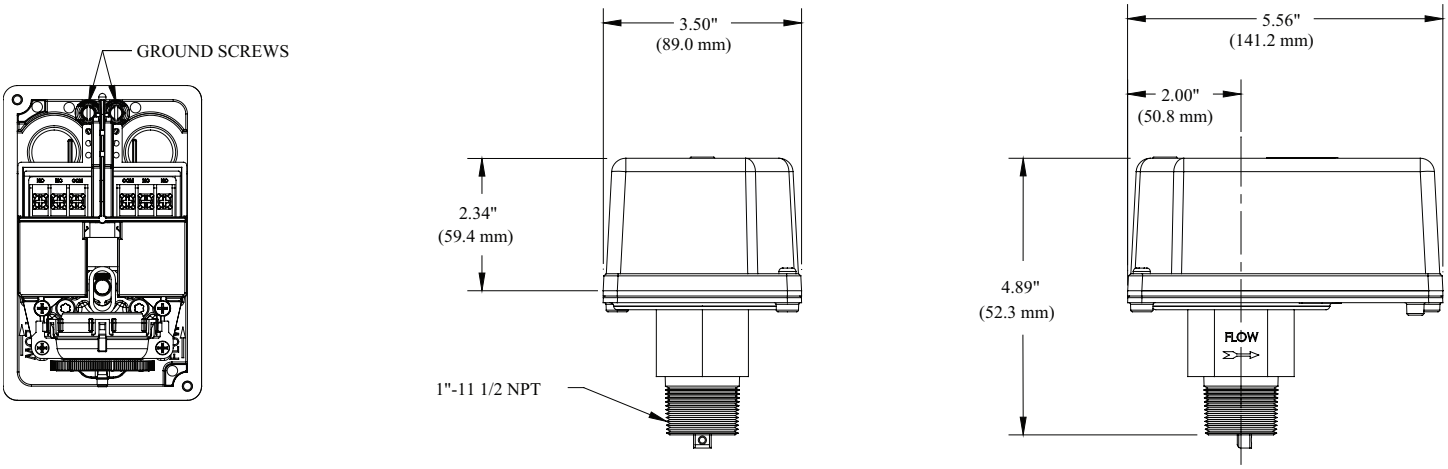
A minimum flow of 10 GPM (38 LPM) is required to activate this device.

NOTICE

Please advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions. Do not obstruct or otherwise prevent the trip stem of the flow switch from moving when water flows as this could damage the flow switch and prevent an alarm. If an alarm is not desired, a Flowswitch Bypass Switch should be used (refer to Potter data sheet 5401554), or a qualified technician should disable the alarm system.

Mounting Dimensions

Fig 8



Maintenance

Inspect detectors monthly for leaks. If leaks are found, replace the detector. The VSR-S waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock number 1029030. There is no maintenance required, only periodic testing and inspection. Vane type watearflow switches have a normal service life of 10-15 years. However, the service life may be significantly reduced by local environmental conditions.

Vane-Type Waterflow Switch for Small Pipe Specification

UL, CUL Listed, LPCB Approved and CE Marked vane type waterflow switches shall be furnished and installed at each sprinkler system connection to the wet pipe main where indicated on the drawings and plans and as required by applicable local and national codes and standards. The device shall consist of a 1" NPT threaded brass bushing for installation into tees and approved manifolds, gasket and non-corrosive vane and trip stem assembly as well as a field replaceable adjustable time delay / switch mechanism to prevent false alarms from water surges. All wetted parts of the waterflow switch shall be non-corrosive to resist being affected by or contributing to corrosion. The waterflow switch enclosures shall be NEMA 4 rated and the cover shall be held captive by tamper resistant screws. It shall be possible to install an optional cover tamper switch to detect removal of the enclosure. The field replaceable instantly recycling adjustable pneumatic retard shall provide a 0-90 second time delay and visual indication of activation. Expiration of the retard time shall result in the simultaneous operation of two sets of single pole double throw (SPDT) switch contacts rated at 10A, 125VAC and 2A, 30VDC. Each switch contact shall have a separate wiring chamber and separate conduit entrance to comply with the NEC requirements for separation of power limited and non power limited conductors without the need for special wire or wire methods. The device shall be listed for pressures up to 300 psi, maximum water surges of 18 fps and alarm activation by a continuous flow of 10gpm. The device shall be Listed for installation on CPVC, brass, copper and iron tees and manifolds from 1" - 2" size. The waterflow switch shall be a model VSR-S manufactured by Potter Electric Signal Company LLC.

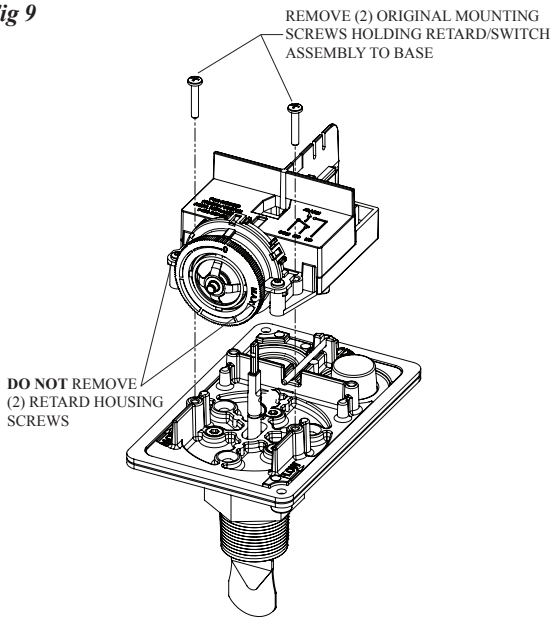
Retard/Switch Assembly Replacement

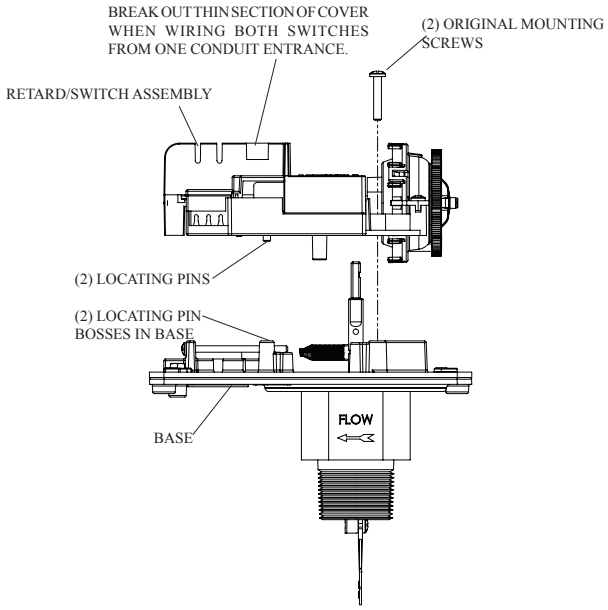
NOTICE

The Retard/Switch Assembly is field-replaceable without draining the system or removing the waterflow switch from the pipe

1. Make sure the fire alarm zone or circuit connected to the waterflow switch is bypassed or otherwise taken out of service.
2. Disconnect the power source for local bell (if applicable).
3. Identify and remove all wires from the waterflow switch.
4. Remove the (2) mounting screws holding retard/switch assembly to the base. **Do not** remove the (2) retard housing screws.
5. Remove the retard assembly by lifting it straight up over the tripstem.
6. Install the new retard assembly. Make sure the locating pins on the retard/switch assembly fit into the locating pin bosses on the base.
7. Re-install the (2) original mounting screws.
8. Reconnect all wires. Perform a flow test and place the system back in service.

Fig 9





Removal of Waterflow Switch

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Use a wrench on the flats of the bushing. Turn the switch counterclockwise to disengage the pipe threads.
- Gently lift with your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector.
- Lift detector clear of pipe.

Ordering Information

Model	Description	Stock Number
VSR-S	VSR-S WATER FLOW INDICATOR	1144440

Replaceable Components: Retard/Switch Assembly, stock no. 1029030
Paddle Tree, stock no. 5559001
Paddle Retention Screw, stock no. 5490374

Optional Components: Cover Tamper Switch, stock no. 0090148
FSBS - Flowswitch Bypass Switch , stock no. 3001006
DG-B-R Surface Mount Double Gang Box - Red F/ FSBS, stock no. 1000484

VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

UL, CUL and CSFM Listed, FM Approved, LPCB Approved, For CE Marked (EN12259-5) / VdS Approved model use VSR-EU

Service Pressure: 450 PSI (31 BAR) - UL

Flow Sensitivity Range for Signal:
4-10 GPM (15-38 LPM) - UL

Maximum Surge: 18 FPS (5.5 m/s)

Contact Ratings: Two sets of SPDT (Form C)
10.0 Amps at 125/250VAC
2.0 Amps at 30VDC Resistive
10 mAmps min. at 24VDC

Conduit Entrances: Two knockouts provided for 1/2" conduit. Individual switch compartments suitable for dissimilar voltages.

Environmental Specifications:

- NEMA 4/IP54 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature Range: 40°F - 120°F, (4.5°C - 49°C) - UL
- Non-corrosive sleeve factory installed in saddle.

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

Specifications subject to change without notice.

Ordering Information			
Nominal Pipe Size		Model	Part Number
2"	DN50	VSR-2	1144402
2 1/2"	DN65	VSR-2 1/2	1144425
3"	DN80	VSR-3	1144403
3 1/2"	-	VSR-3 1/2	1144435
4"	DN100	VSR-4	1144404
5"	-	VSR-5	1144405
6"	DN150	VSR-6	1144406
8"	DN200	VSR-8	1144408

Optional: Cover Tamper Switch Kit, stock no. 0090148
Replaceable Components: Retard/Switch Assembly, stock no. 1029030

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

CAUTION

Waterflow switches that are monitoring wet pipe sprinkler systems shall not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems. Waterflow switches used for this application may result in unintended discharges caused by surges, trapped air, or short retard times.

General Information

The Model VSR is a vane type waterflow switch for use on wet sprinkler systems. It is UL Listed and FM Approved for use on steel pipe; schedules 10 through 40, sizes 2" thru 8" (50 mm thru 200 mm). LPC approved sizes are 2" thru 8" (50 mm thru 200 mm). See Ordering Information chart.

The VSR may also be used as a sectional waterflow detector on large systems. The VSR contains two single pole, double throw, snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 GPM (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

Enclosure

The VSR switches and retard device are enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin number 5401103 for installation instructions of this switch.

VSR
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

Installation (see Fig. 1)

These devices may be mounted on horizontal or vertical pipe. On horizontal pipe they shall be installed on the top side of the pipe where they will be accessible. The device should not be installed within 6" (15 cm) of a fitting which changes the direction of the waterflow or within 24" (60 cm) of a valve or drain.

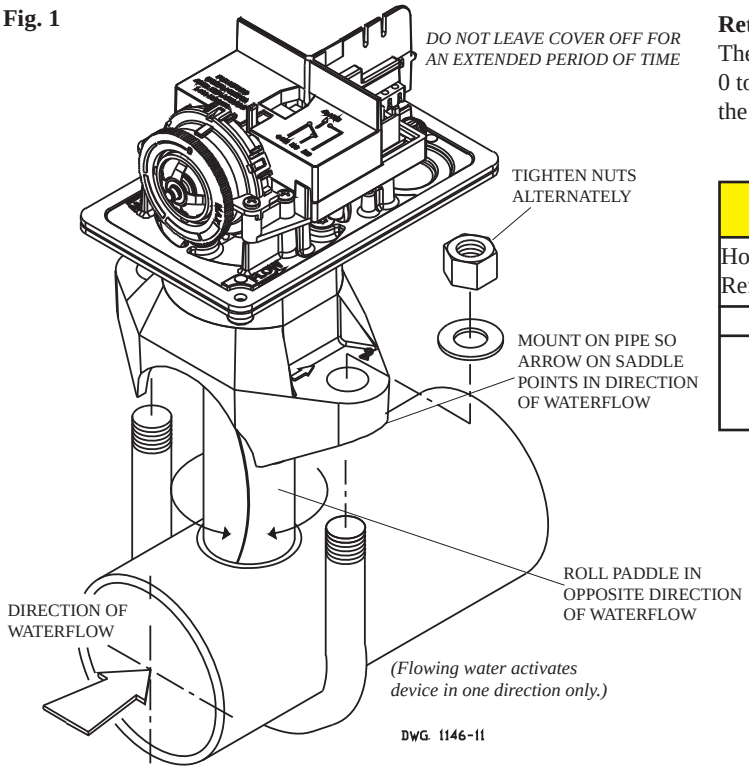
NOTE: Do not leave cover off for an extended period of time.

Drain the system and drill a hole in the pipe using a hole saw in a slow speed drill (see Fig. 1). Clean the inside pipe of all growth or other material for a distance equal to the pipe diameter on either side of the hole. Roll the vane so that it may be inserted into the hole; do not bend or crease it. Insert the vane so that the arrow on the saddle points in the direction of the waterflow. Take care not to damage the non-corrosive bushing in the saddle. The bushing should fit inside the hole in the pipe. Install the saddle strap and tighten nuts alternately to required torque (see the chart in Fig. 1). The vane must not rub the inside of the pipe or bind in any way.

⚠ CAUTION

Do not trim the paddle. Failure to follow these instructions may prevent the device from operating and will void the warranty.

Fig. 1

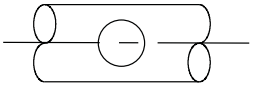
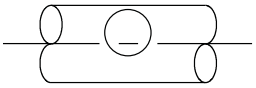


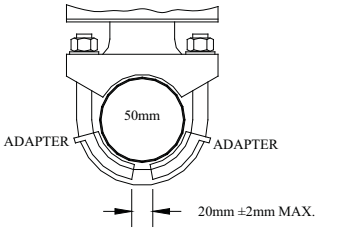
Retard Adjustment

The delay can be adjusted by rotating the retard adjustment knob from 0 to the max setting (60-90 seconds). The time delay should be set at the minimum required to prevent false alarms

CAUTION

Hole must be drilled perpendicular to the pipe and vertically centered. Refer to the Compatible Pipe/Installation Requirements chart for size.

Correct	Incorrect
	



DN50 ONLY

USE (2) 5180162 ADAPTERS AS SHOWN ABOVE

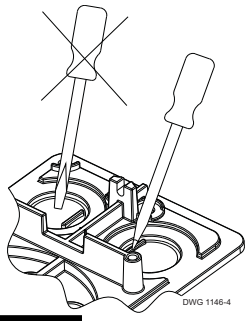
DWG# 1146-1F

Compatible Pipe/ Installation Requirements

Model	Nominal Pipe Size		Nominal Pipe O.D.		Pipe Wall Thickness								Hole Size		U-Bolt Nuts Torque	
					Schedule 10 (UL)		Schedule 40 (UL)		BS-1387 (LPC)		DN (VDS)					
	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	ft-lb	n-m
VSR-2	2	DN50	2.375	60.3	0.109	2.77	0.154	3.91	0.142	3.6	0.091	2.3	1.25 + .125/-.062	33.0 ± 2.0	20	27
VSR-2 1/2	2.5	-	2.875	73.0	0.120	3.05	0.203	5.16	-	-	-	-				
VSR-2 1/2	-	DN65	3.000	76.1	-	-	-	-	0.142	3.6	0.102	2.6				
VSR-3	3	DN80	3.500	88.9	0.120	3.05	0.216	5.49	0.157	4.0	0.114	2.9	2.00 + .125	50.8 + 2.0		
VSR-3 1/2	3.5	-	4.000	101.6	0.120	3.05	0.226	5.74	-	-	-	-				
VSR-4	4	DN100	4.500	114.3	0.120	3.05	0.237	6.02	0.177	4.5	0.126	3.2				
VSR-5	5	-	5.563	141.3	0.134	3.40	0.258	6.55	-	-	-	-				
VSR-6	6	DN150	6.625	168.3	0.134	3.40	0.280	7.11	0.197	5.0	0.157	4.0				
VSR-8	8	DN200	8.625	219.1	0.148	3.76	0.322	8.18	0.248	6.3	0.177	4.5				

NOTE: For copper or plastic pipe use Model VSR-CF.

Fig. 2
To remove knockouts: Place screwdriver at inside edge of knockouts, not in the center.



NOTICE
Do not drill into the base as this creates metal shavings which can create electrical hazards and damage the device. Drilling voids the warranty.

Fig. 3
Break out thin section of cover when wiring both switches from one conduit entrance.

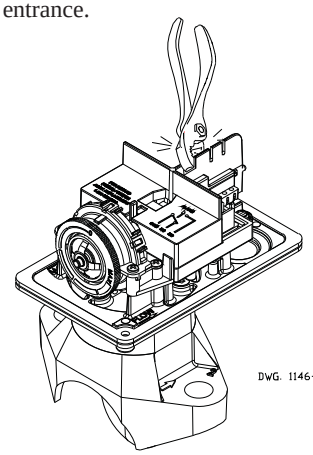
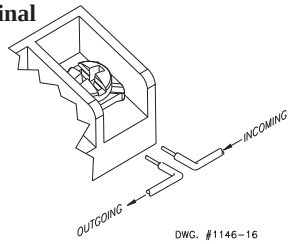


Fig. 4 Switch Terminal Connections Clamping Plate Terminal

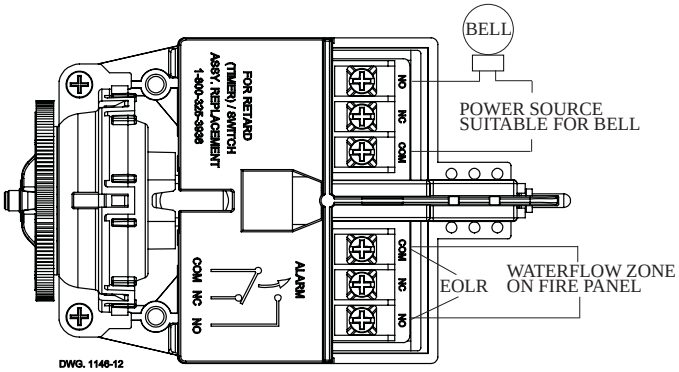


WARNING
An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render the device inoperable risking severe property damage and loss of life.

Do not strip wire beyond 3/8" of length or expose an uninsulated conductor beyond the edge of the terminal block. When using stranded wire, capture all strands under the clamping plate.

Fig. 5 Typical Electrical Connections

Notes:
1. The Model VSR has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. A condition of LPC Approval of this product is that the electrical entry must be sealed to exclude moisture.
3. For supervised circuits, see "Switch Terminal Connections" drawing and warning note (Fig. 4).

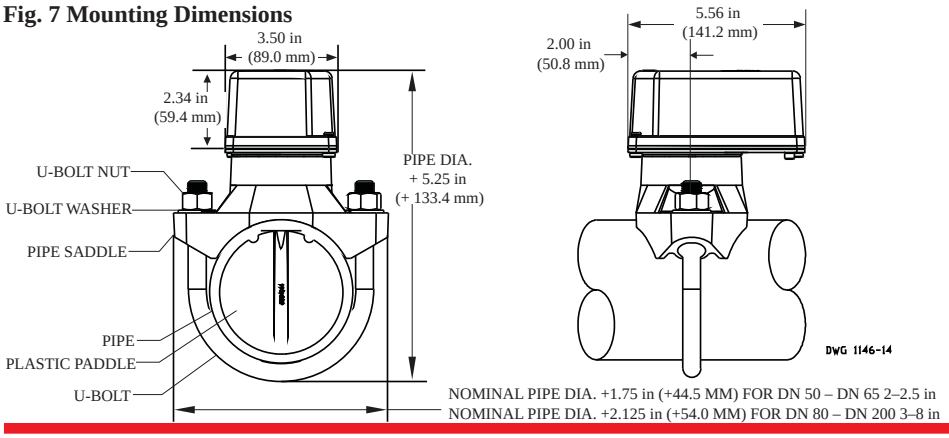


Testing
The frequency of inspection and testing for the Model VSR and its associated protective monitoring system shall be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

If provided, the inspector's test valve shall always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR is not recommended or advisable.
A minimum flow of 10 GPM (38 LPM) is required to activate this device.

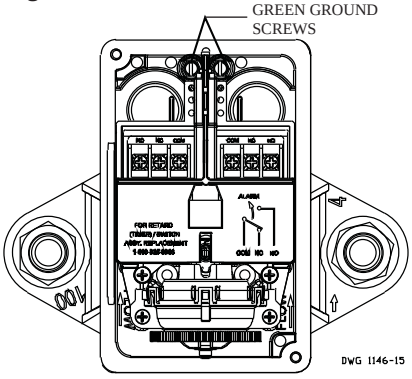
NOTICE Advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions.

Fig. 7 Mounting Dimensions



NOMINAL PIPE DIA. +1.75 in (+44.5 MM) FOR DN 50 – DN 65 2–2.5 in
NOMINAL PIPE DIA. +2.125 in (+54.0 MM) FOR DN 80 – DN 200 3–8 in

Fig. 8



Maintenance

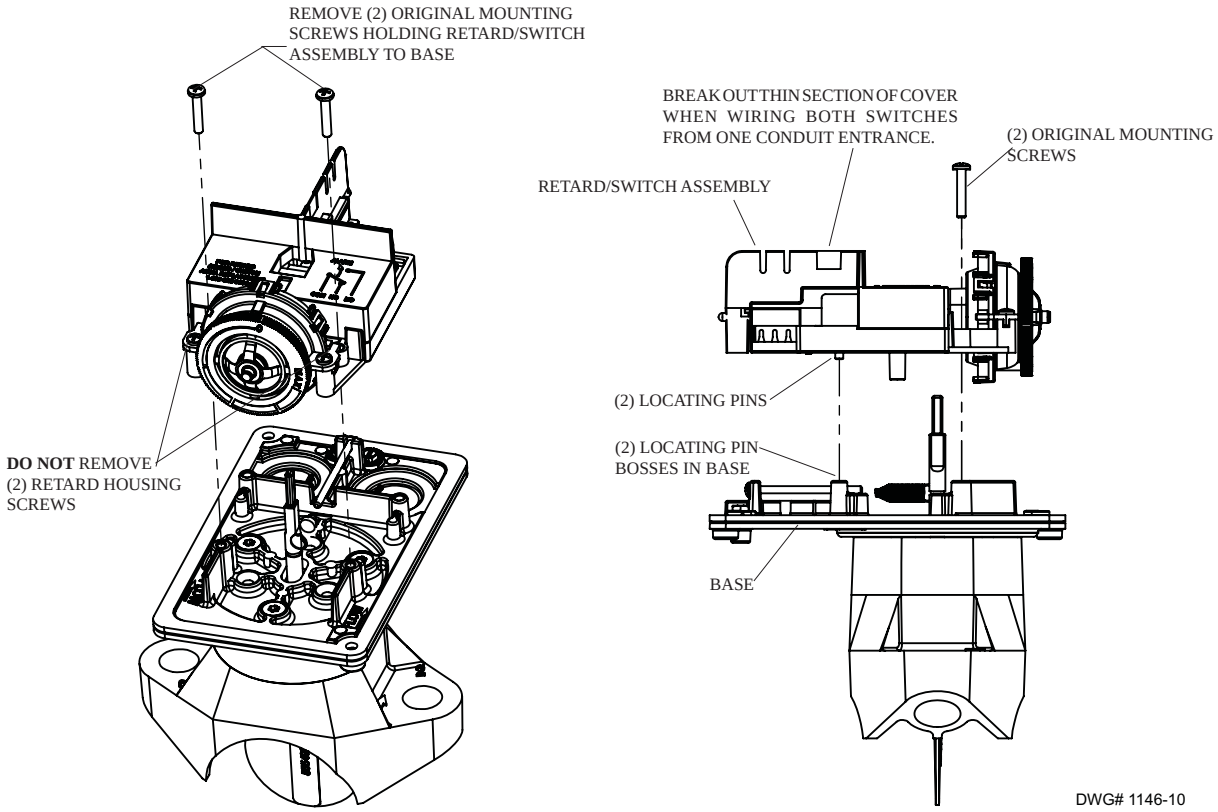
Inspect detectors monthly. If leaks are found, replace the detector. The VSR waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock #1029030 (see Fig. 6). There is no maintenance required, only periodic testing and inspection.

Retard/Switch Assembly Replacement (See Fig. 6)

NOTICE The Retard/Switch Assembly is field-replaceable without draining the system or removing the waterflow switch from the pipe

1. Make sure the fire alarm zone or circuit connected to the waterflow switch is bypassed or otherwise taken out of service.
2. Disconnect the power source for local bell (if applicable).
3. Identify and remove all wires from the waterflow switch.
4. Remove the (2) mounting screws holding retard/switch assembly to the base. **Do not** remove the (2) retard housing screws.
5. Remove the retard assembly by lifting it straight up over the tripstem.
6. Install the new retard assembly. Make sure the locating pins on the retard/switch assembly fit into the locating pin bosses on the base.
7. Re-install the (2) original mounting screws.
8. Reconnect all wires. Perform a flow test and place the system back in service.

Fig. 6



Removal of Waterflow Switch

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Loosen nuts and remove U-bolts.
- Gently lift the saddle far enough to get your fingers under it. With your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector saddle.
- Lift detector clear of pipe.

OSYSU-1,-2

OUTSIDE SCREW AND YOKE VALVE SUPERVISORY SWITCH

UL, cUL and CSFM Listed, FM Approved, NYMEA Accepted, CE Marked

Dimensions: 6.19"L X 2.25"W X 5.88"H
15,7cm L X 5,7cm W X 14,6cm H

Weight: 2 lbs (0,9 kg)

Enclosure: Cover - Die-Cast
Finish - Red Spatter Enamel
Base - Die Cast Zinc
All parts have corrosion resistant finishes

Cover Tamper: Tamper Resistant Screws
Optional Cover Tamper Switch Available

Contact Ratings:
OSYSU-1: One set of SPDT (Form C)
OSYSU-2: Two sets of SPDT (Form C)
15 Amps at 125/250VAC
2.5 Amps at 30VDC resistive

Environmental Limitations:
-40°F to 140°F (-40°C to 60°C)
NEMA 4 and NEMA 6P Enclosure (IP67)
Indoor or outdoor use (Not for use in hazardous locations. See Bulletin No. 5400705 OSYS-U-EX for hazardous locations).

Conduit Entrances:
2 knockouts for 1/2" conduit provided

Service Use:

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

General Information

The OSYSU is used to monitor the open position of an OS&Y (outside screw and yoke) type gate valve. This device is available in two models; the OSYSU-1, containing one set of SPDT (Form C) contacts and the OSYSU-2, containing two sets of SPDT (Form C) contacts. These switches mount conveniently to most OS&Y valves ranging in size from 2" to 12" (50mm to 300mm). They will mount on some valves as small as ½" (12,5mm).

The cover is held in place by two tamper resistant screws that require a special tool to remove. The tool is furnished with each device and should be left with the building owner or responsible party. Replacement or additional cover screws and hex keys are available. See Ordering Information.

Optional Cover Tamper Switch

A field installable cover tamper switch is available as an option which may be used to indicate removal of the cover. See Ordering Information.

Testing

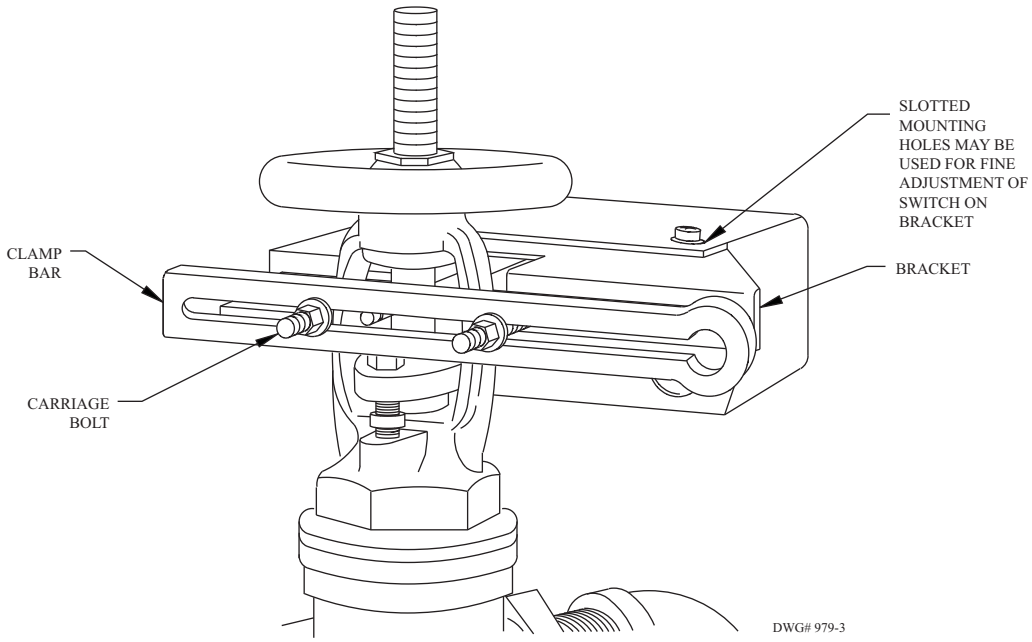
The OSYSU and its associated protective monitoring system should be inspected and tested in accordance with applicable NFPA codes and standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

Ordering Information

Model	Description	Stock No.
OSYSU-1	Outside Screw & Yoke Supervisory Switch (Single switch)	1010106
OSYSU-2	Outside Screw & Yoke Supervisory Switch (Double switch)	1010206
	Cover Screw	5490424
	Hex Key for Cover Screws and Installation Adjustments	5250062
	Optional Cover Tamper Switch Kit	0090131

FIG. 1 **SMALL VALVE INSTALLATION - 1/2" THRU 2 1/2" SIZES**

These switches mount conveniently to most 2" to 12" OS&Y valves. They will mount on some valves as small as 1/2". J-hooks may be required on valves with limited clearance.



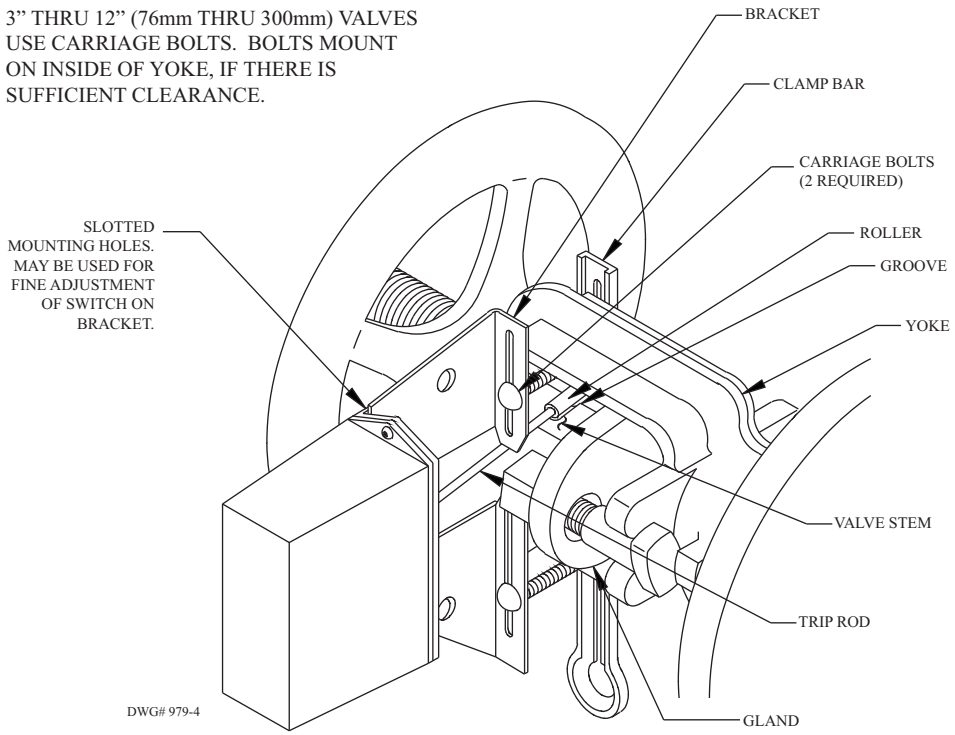
SMALL VALVE INSTALLATION

1. Remove and discard "C" washer and roller from the trip rod.
2. With the valve in the FULL OPEN position, locate the OSYSU across the valve yoke as far as possible from the valve gland, so that the trip rod lays against the non-threaded portion of the valve stem.
3. Loosen the locking screw that holds the trip rod in place and adjust the rod length (see Fig. 4). When adjusted properly, the rod should extend past the valve screw, but not so far that it contacts the clamp bar. Tighten the locking screw to hold the trip rod in place.

   NOTE: If trip rod length is excessive, loosen the locking screw and remove the trip rod from the trip lever. Using pliers, break off the one (1) inch long notched section (see Fig. 5). Reinstall trip rod and repeat Step 3 procedure.
4. Mount the OSYSU loosely with the carriage bolts and clamp bar supplied. On valves with limited clearance use J-hooks supplied instead of the carriage bolts and clamp bar to mount the OSYSU.
5. Mark the valve stem at the center of the trip rod.
6. Remove the OSYSU. File a 1/8" deep groove centered on the mark on the valve stem utilizing a 3/16" diameter straight file. Round and smooth the edges of the groove to prevent damage to the valve packing and to allow the trip rod to move easily in and out of the groove as the valve is operated.
7. Mount the OSYSU with the trip rod centered in groove.
8. Final adjustment is made by loosening 2 screws (see Fig. 1) and sliding the OSYSU on the bracket. Adjustment is correct when switches are not activated with the trip rod seated in the valve stem groove and that the switches activate when the trip rod moves out of the groove.
9. Tighten the adjustment screws and all mounting hardware. Check to insure that the rod moves out of the groove easily and that the switches activate within one turn when the valve is operated from the FULL OPEN towards the CLOSED position.

NOTE: CLOSE THE VALVE FULLY TO DETERMINE THAT THE STEM THREADS DO NOT ACTIVATE THE SWITCH. THE SWITCH BEING ACTIVATED BY THE STEM THREADS COULD RESULT IN A ***FALSE VALVE OPEN*** INDICATION.

FIG. 2 LARGE VALVE INSTALLATION - 3" THRU 12" SIZES



LARGE VALVE INSTALLATION

1. With the valve in the FULL OPEN position, locate the OSYSU across the valve yoke as far as possible from the valve gland, so that the trip rod lays against the non-threaded portion of the valve stem.
2. Mount the OSYSU loosely with the carriage bolts and clamp bar supplied.
3. Loosen the locking screw that holds the trip rod in place and adjust the rod length (see Fig. 4). When adjusted properly, the rod should extend past the valve screw, but not so far that it contacts the clamp bar. Tighten the locking screw to hold the trip rod in place.

   NOTE: If trip rod length is excessive, loosen the locking screw and remove the trip rod from the trip lever. Using pliers, break off the one (1) inch long notched section (see Fig. 5). Reinstall trip rod and repeat Step 3 procedure.
4. Mark the valve stem at the center of the trip rod.
5. Remove the OSYSU. File a 1/8" deep groove centered on the mark of the valve stem utilizing a 3/8" diameter straight file. Round and smooth the edges of the groove to prevent damage to the valve packing and to allow the trip rod to move easily in and out of the groove as the valve is operated.
6. Mount the OSYSU loosely with the trip rod centered in groove.
7. Final adjustment is made by loosening 2 screws (see Fig. 2) and sliding the OSYSU on the bracket. Adjustment is correct when switches are not activated with the trip rod seated in the valve stem groove and that the switches activate within one turn when the valve is operated from the FULL OPEN towards the CLOSED position.
8. Tighten the adjustment screws and mounting hardware. Check to insure that the rod moves out of the groove easily and that the switches activate within one turn when the valve is operated from the FULL OPEN towards the CLOSED position.

NOTE: CLOSE THE VALVE FULLY TO DETERMINE THAT THE STEM THREADS DO NOT ACTIVATE THE SWITCH. THE SWITCH BEING ACTIVATED BY THE STEM THREADS COULD RESULT IN A ***FALSE VALVE OPEN*** INDICATION.

OSYSU-1,-2
OUTSIDE SCREW AND YOKE VALVE SUPERVISORY SWITCH

FIG. 3 **DIMENSIONS**

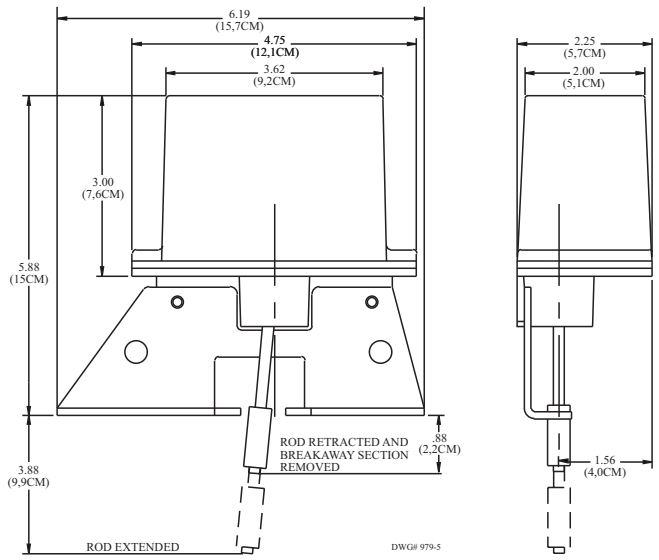
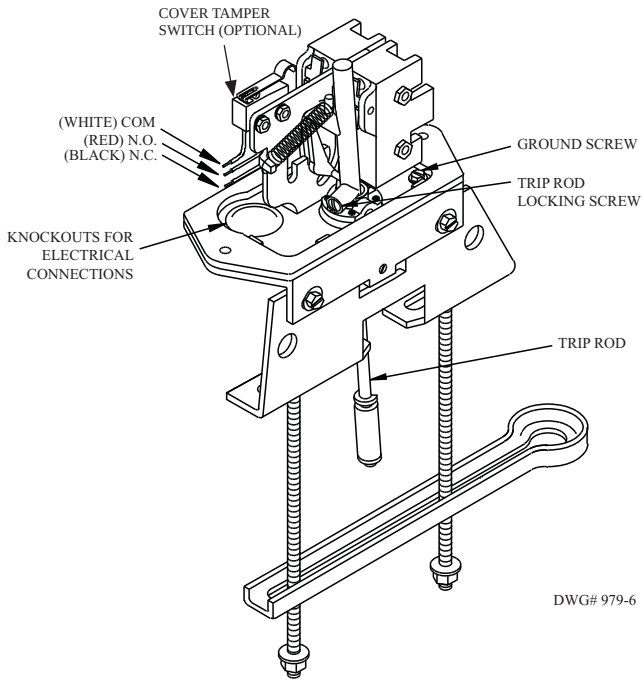
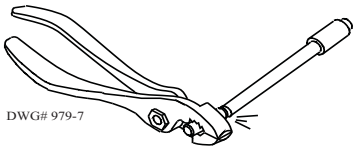


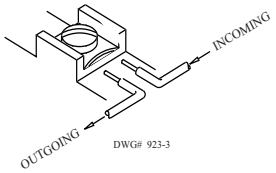
FIG. 4 **PARTS**



BREAKING EXCESSIVE ROD LENGTH

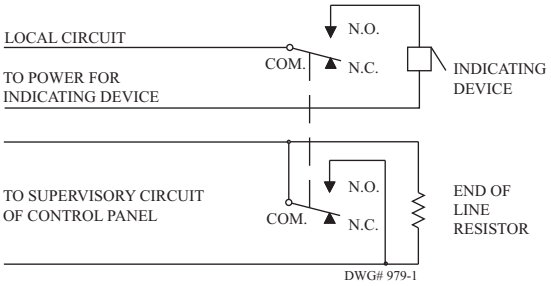


SWITCH TERMINAL CONNECTIONS CLAMPING PLATE TERMINAL



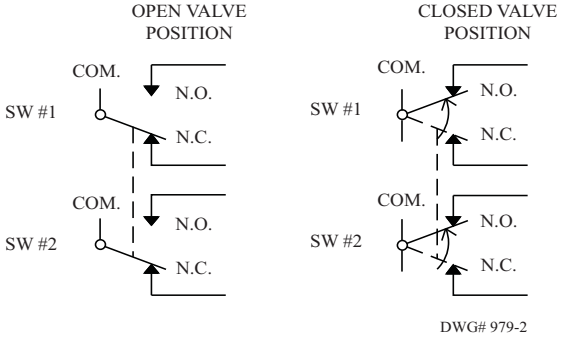
CAUTION:
An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire becomes dislodged from under the terminal.

TYPICAL ELECTRICAL CONNECTIONS



Contacts shown in normal (valve open) condition.

TYPICAL SWITCH ACTION



POTTER
The Symbol of Protection

BELLS

PBA-AC & MBA-DC

UL, ULC, and FM Approved
Sizes Available: 6" (150mm), 8" (200mm) and 10" (250mm)
Voltages Available: 24VAC
120VAC
12VDC (10.2 to 15.6) Polarized
24VDC (20.4 to 31.2) Polarized
Service Use: Fire Alarm
General Signaling
Burglar Alarm
Environment: Indoor or outdoor use (See Note 1)
-40° to 150°F (-40° to 66°C)
(Outdoor use requires weatherproof backbox.)
Termination: AC Bells - 4 No. 18 AWG stranded wires
DC Bells - Terminal strip
Finish: Red powder coating
Optional: Model BBK-1 weatherproof backbox
Model BBX-1 deep weatherproof backbox

These vibrating type bells are designed for use as fire, burglar or general signaling devices. They have low power consumption and high decibel ratings. The unit mounts on a standard 4" (101mm) square electrical box for indoor use or on a model BBK-1 weatherproof backbox or BBX-1 deep weatherproof backbox for outdoor applications. Weatherproof backbox model BBK-1, Stock No. 1500001.

Notes:
1. Minimum dB ratings are calculated from integrated sound pressure measurements made at Underwriters Laboratories as specified in UL Standard 464. UL temperature range is -30° to 150°F (-34° to 66°C).
2. Typical dB ratings are calculated from measurements made with a conventional sound level meter and are indicative of output levels in an actual installation.
3. ULC only applies to MBA DC bells.

Size inches (mm)	Voltage	Model Number	Stock Number	Current (Max.)	Typical dB at 10 ft. (3m) (2)	Minimum dB at 10 ft. (3m) (1)
6 (150)	12VDC	MBA-6-12	1750070	.12A	85	76
8 (200)	12VDC	MBA-8-12	1750080	.12A	90	77
10 (250)	12VDC	MBA-10-12	1750060	.12A	92	78
6 (150)	24VDC	MBA-6-24	1750100	.06A	87	77
8 (200)	24VDC	MBA-8-24	1750110	.06A	91	79
10 (250)	24VDC	MBA-10-24	1750090	.06A	94	80
6 (150)	24VAC	PBA246	1806024*	.17A	91	78
8 (200)	24VAC	PBA248	1808024*	.17A	94	77
10 (250)	24VAC	PBA2410	1810024*	.17A	94	78
6 (150)	120VAC	PBA1206	1806120*	.05A	92	83
8 (200)	120VAC	PBA1208	1808120*	.05A	99	84
10 (250)	120VAC	PBA12010	1810120*	.05A	99	86

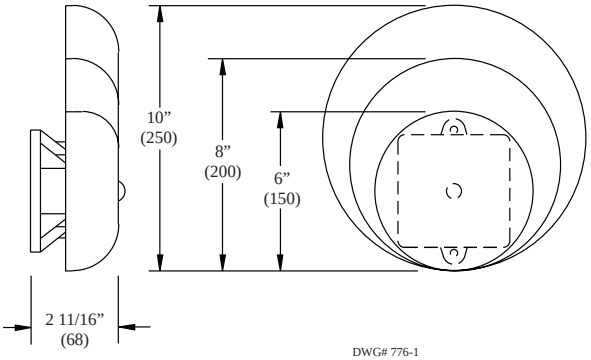
COORDINATE VOLTAGE W/ ELECTRICIAN 10" BELL SIZE

All DC bells are polarized and have built-in transient protection.
* Does not have ULC listing.

⚠ WARNING

In outdoor or wet installations, bell must be mounted with weatherproof backbox, BBK-1 or BBX-1. Standard electrical boxes will not provide a weatherproof enclosure. If the bell and/or assembly is exposed to moisture, it may fail or create an electrical hazard.

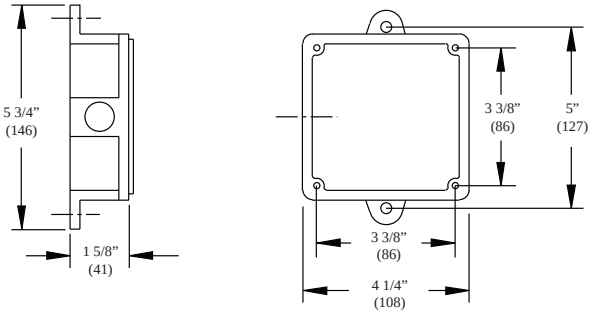
Bells Dimensions Inches (mm)
Fig. 1



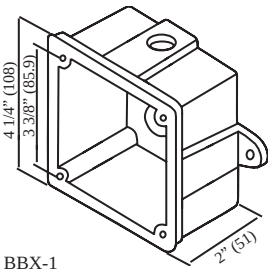
DWG# 776-1

Weatherproof Backbox Dimensions Inches (mm)
Fig. 2

Box has one threaded 1/2" conduit entrance



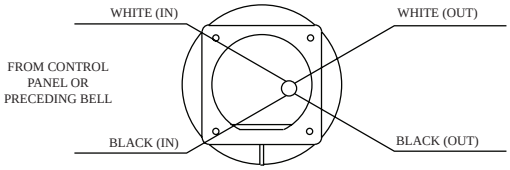
DWG# 776-2



BBX-1

Wiring (rear view)
Fig. 3

A.C. BELLS

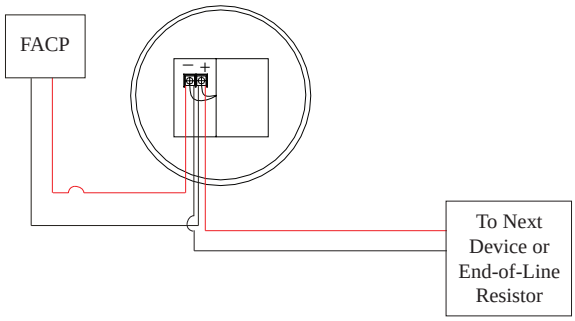


CAUTION:
WHEN ELECTRICAL SUPERVISION IS REQUIRED USE IN AND OUT LEADS AS SHOWN.

NOTES:

1. WHEN USING AC BELLS, TERMINATE EACH EXTRA WIRE SEPARATELY AFTER LAST BELL.
2. END-OF-LINE RESISTOR IS NOT REQUIRED ON AC BELLS.

DWG# 776-3



Installation
1. The bell shall be installed in accordance with NFPA 13, 72, or local AHJ. The top of the device shall be no less than 90" AFF and not less than 6" below the ceiling.
2. Remove the gong.
3. Connect wiring (see Fig. 3).
4. Mount bell mechanism to backbox (bell mechanism must be mounted with the striker pointing down).
5. Reinstall the gong (be sure that the gong positioning pin, in the mechanism housing, is in the hole in the gong).
6. Test all bells for proper operation and observe that they can be heard where required (bells must be heard in all areas as designated by the authority having jurisdiction).

⚠ WARNING

Failure to install striker down will prevent bell from operating.

tyco / Fire & Building Products

Technical Services: Tel: (800) 381-9312 / Fax: (800) 791-5500

Sprinkler Cabinets
3, 6, & 12 Sprinklers, 1/2 or 3/4 Inch NPT
6 ESFR Sprinklers, 3/4 or 1 Inch NPT

General Description

Tyco® Sprinkler Cabinets are constructed of metal enclosures with hinged covers designed to provide on-site storage of an emergency supply of sprinklers and a sprinkler wrench.

NFPA 13 requires a representative number of each type of sprinkler used in a sprinkler system to be stored in a cabinet on-site to allow for immediate removal and replacement of sprinklers that may have operated or become damaged.

Sprinkler Cabinets are manufactured of heavy gauge steel with knock-outs to accommodate NPT threaded sprinklers and are painted an attractive red enamel.

WARNINGS

The Sprinkler Cabinets described herein must be installed and maintained 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 performance of these devices.***

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 with any questions.

Technical Data

Material
Carbon Steel

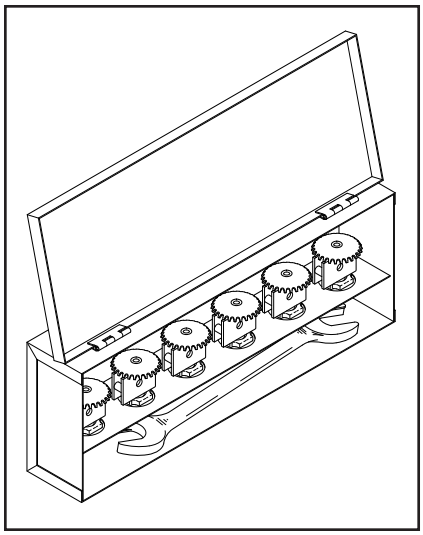
Weights

3 Sprinkler Cabinet . . . . . 1.5 Lbs. (0,68 kg)

6 Sprinkler Cabinet . . . . . 2.3 Lbs. (1,04 kg)

12 Sprinkler Cabinet . . . . . 4.0 Lbs. (1,81 kg)

6 ESFR Sprinkler Cabinet . . . . . 3.3 Lbs. (1,36 kg)



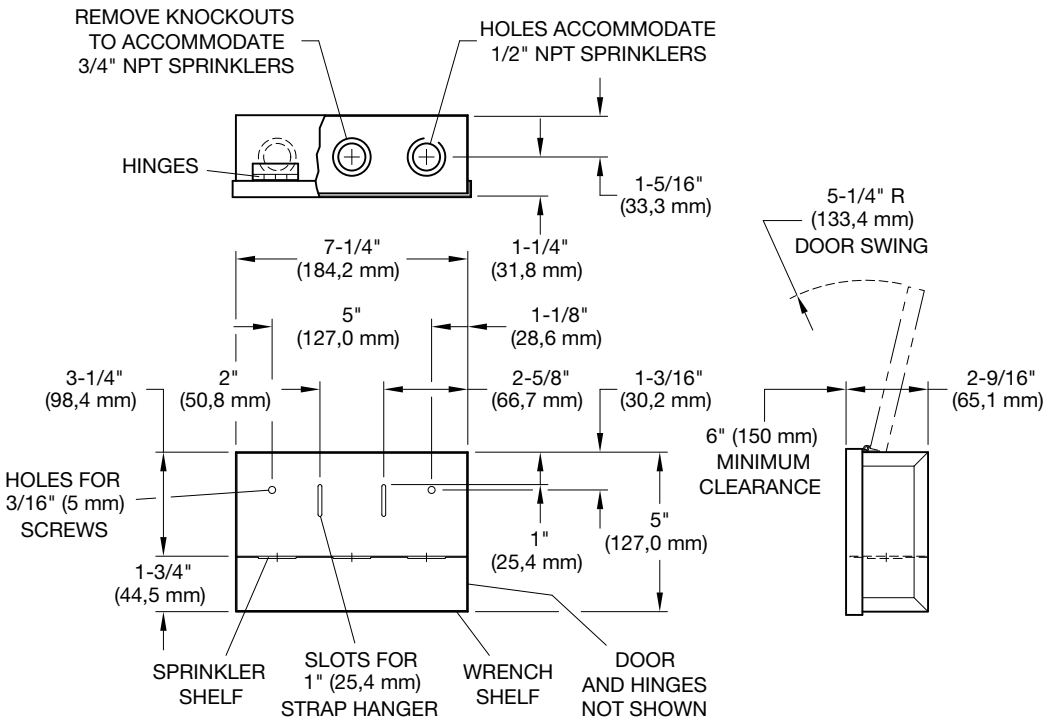


FIGURE 1
3 SPRINKLER CABINET

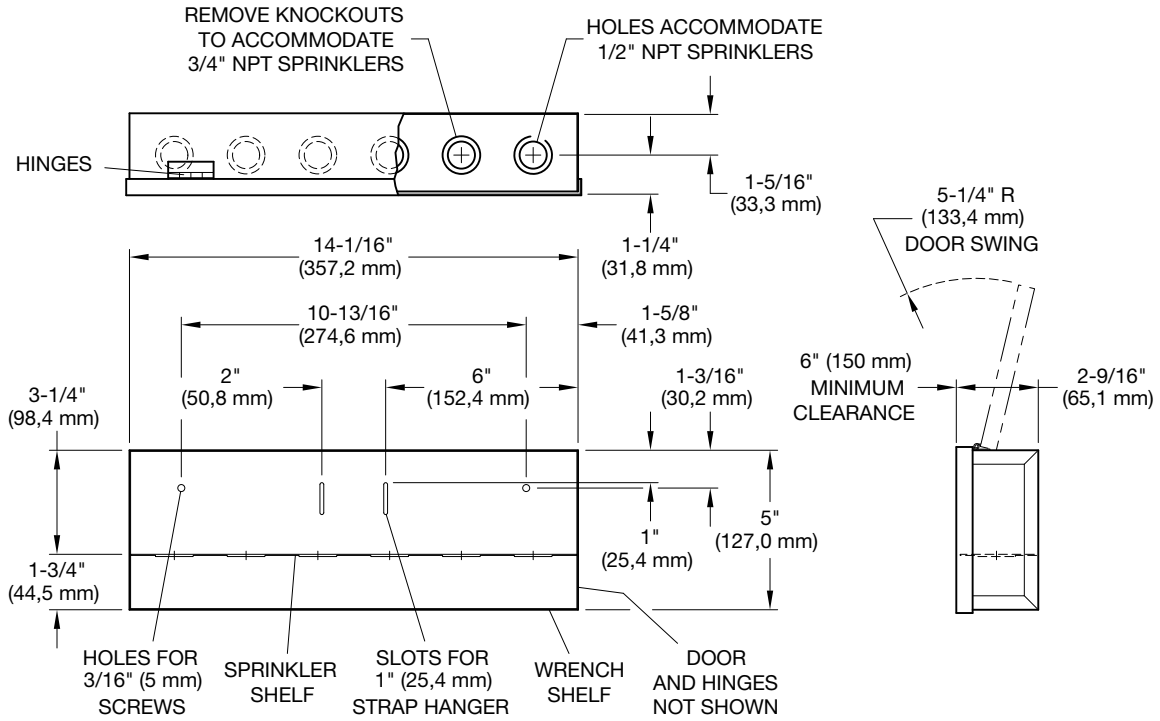


FIGURE 2
6 SPRINKLER CABINET

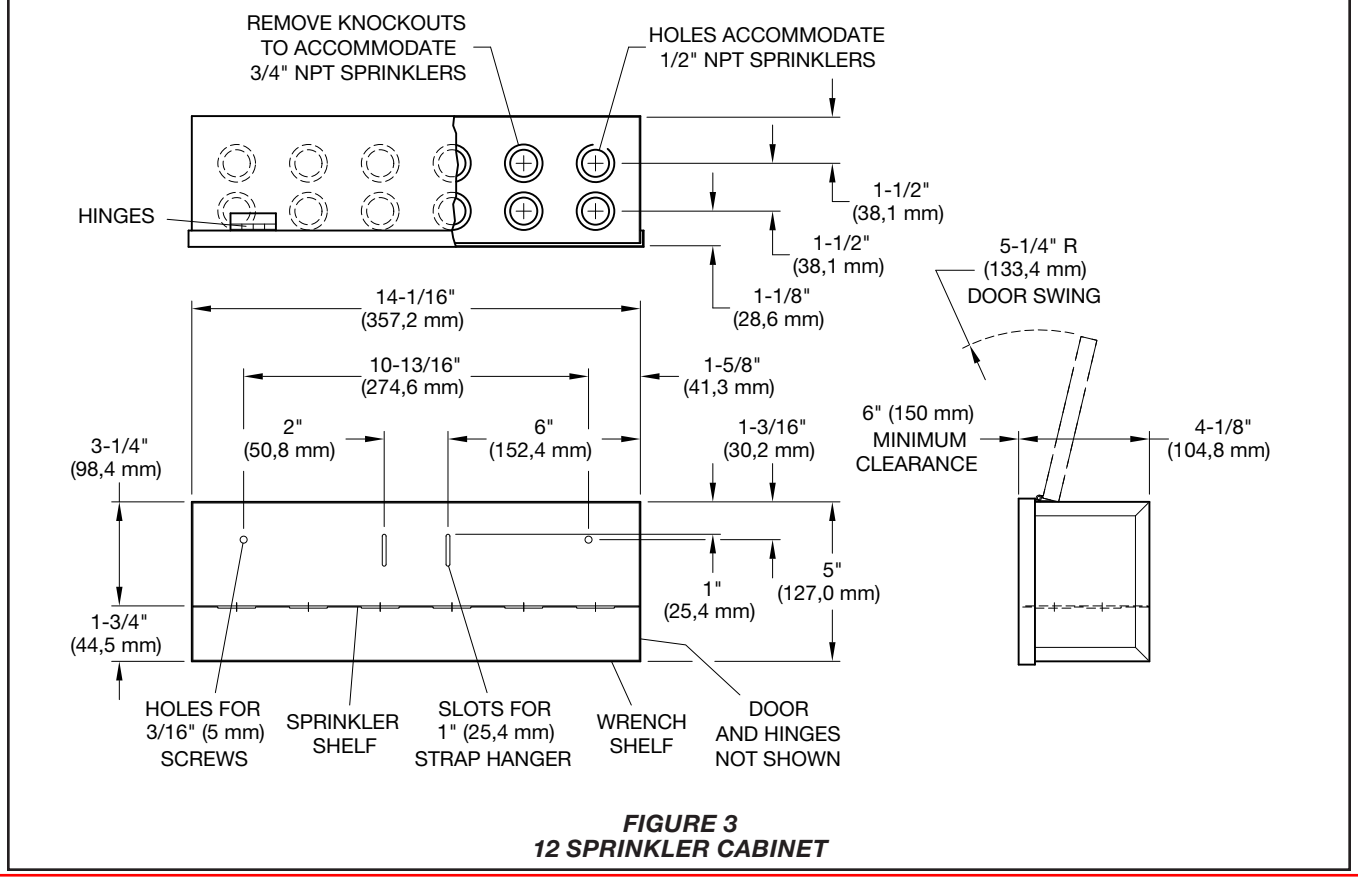


FIGURE 3
12 SPRINKLER CABINET

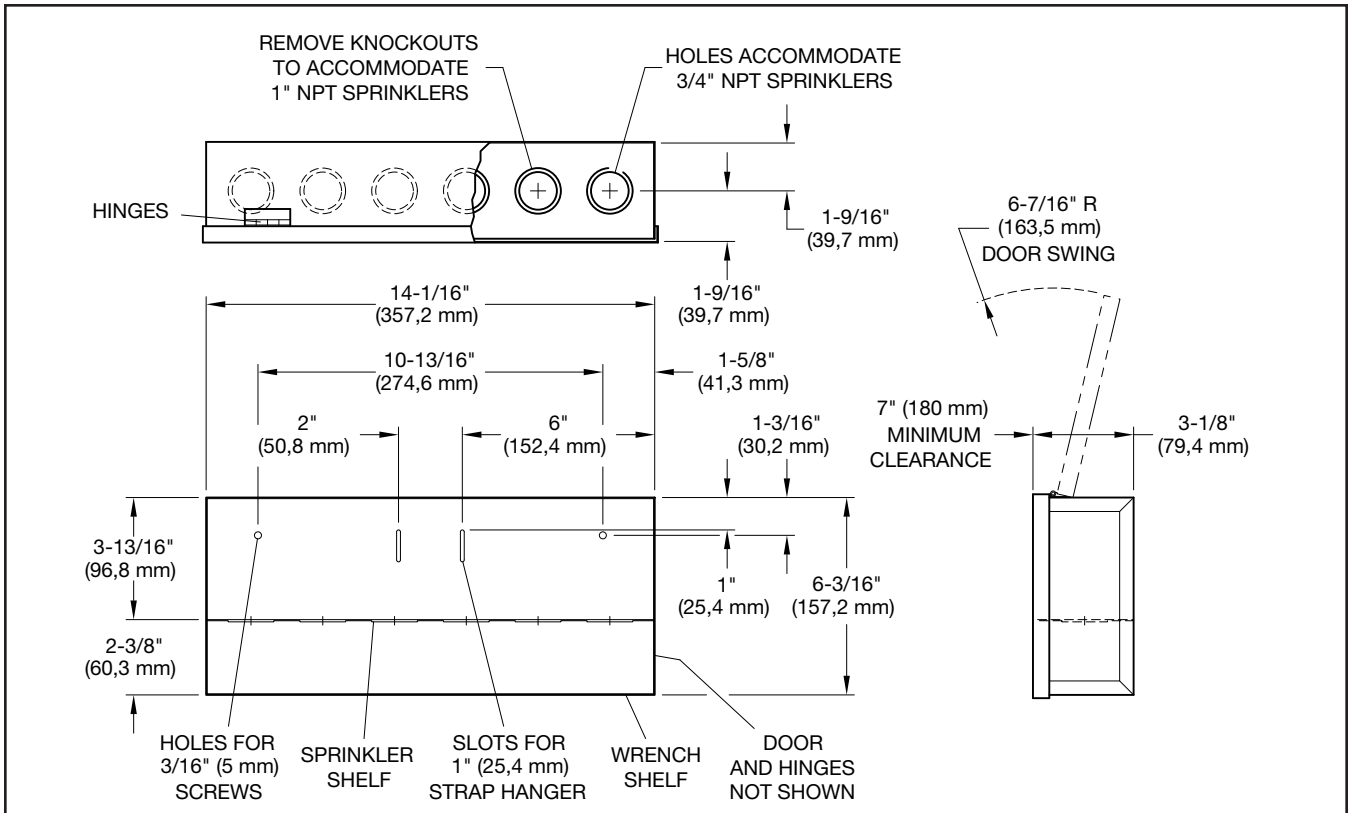


FIGURE 4
6 ESFR SPRINKLER CABINET

Installation

Sprinkler Cabinets are designed with two 3/16 Inch (4,7 mm) diameter holes for wall mounting or direct attachment to the system riser with a strap-type hanger. The Sprinkler Cabinet should be installed at or near the system control valve and must be stocked with an adequate supply of spare sprinklers and a sprinkler wrench.

The stock of spare sprinklers should include sprinklers of each type and temperature rating as are installed in the sprinkler system, in the following quantities:

Sprinklers In System	Spare Sprinklers Required
Under 300	6
300-1000	12
Over 1000	24

The 3, 6, and 12 Sprinkler Cabinets are designed to accept both 1/2 & 3/4 Inch NPT threaded sprinklers, whereas the 6 ESFR Sprinkler Cabinets are designed to accept both 3/4 & 1 Inch NPT threaded sprinklers. As necessary, insert a screwdriver blade from the front top of the shelf and under the near bottom part of the knockout annular ring. Press the screwdriver handle down to remove the knockout ring.

Care and Maintenance

The Sprinkler Cabinet, wrench, and stock of spare sprinklers should be inspected at least quarterly. The following items should be checked:

- The Sprinkler Cabinet should be readily accessible, and not exposed to a corrosive atmosphere or temperatures in excess of 100°F (38°C).
- The stock of spare sprinklers should include an adequate number of each type and temperature rating.
- The stock of sprinklers must be in good condition.
- A sprinkler wrench of the appropriate type must be included in the Sprinkler Cabinet.

Limited Warranty

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

When placing an order, indicate the full product name. Contact your local distributor for availability.

Sprinkler Cabinet:
Specify: (Description), P/N (specify).

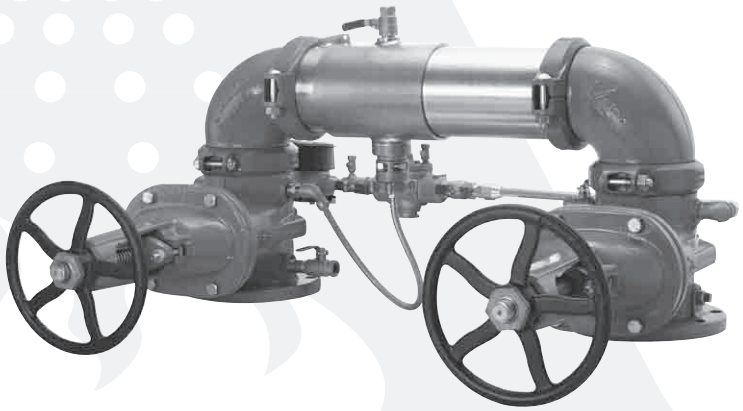
3 Sprinkler Cabinet. . . . . P/N 1177
6 Sprinkler Cabinet. . . . . P/N 1119
12 Sprinkler Cabinet. . . . . P/N 1124
6 ESFR Sprinkler Cabinet . . . . . P/N 1111

SHOWN FOR HYDRAULIC REFERENCE

Colt™ Series C500, C500N, C500Z

Reduced Pressure Detector Assemblies

Sizes: 2½" – 10" (65 – 250mm)



C500N OSY

Features

- Extremely Compact Design
- 70% Lighter than Traditional Designs
- 304 (Schedule 40) Stainless Steel Housing & Sleeve
- Groove Fittings Allow Integral Pipeline Adjustment
- Patented Link Check Provides Lowest Pressure Loss
- Unmatched Ease of Serviceability
- Replaceable Check Disc Rubber
- Available with Grooved Butterfly Valve Shutoffs
- Bottom Mounted Cast Stainless Steel Relief Valve
- Metered Bypass to Detect Leakage or Theft of Water from the Fire Sprinkler System

The Colt C500, C500N, C500Z Reduced Pressure Detector Assemblies provide protection to the potable water system from contamination in accordance with national plumbing codes. The Colt C500, C500N, C500Z are normally used in health-hazard applications to protect against backsiphonage, backpressure and the fouling of either check valve. The Colt C500, C500N, C500Z are used to monitor unauthorized use of water from the fire protection system.

Specifications

The Colt C500, C500N, C500Z Reduced Pressure Detector Assemblies shall consist of two independent Link Check modules, a differential pressure relief valve located between and below the two modules, two drip tight shutoff valves, and required test cocks. Link Check modules and relief valve shall be contained within a sleeve accessible single housing constructed from 304 (Schedule 40) stainless steel pipe with groove end connections. Link Checks shall have reversible elastomer discs and in operation produce drip tight closure against the reverse flow of liquid caused by backpressure or backsiphonage. The bypass assembly consists of a meter registering either gallon or cubic measurements, a reduced pressure zone assembly and required test cocks. Assembly shall be Colt C500, C500N, C500Z as manufactured by the Ames Company.

Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

Approval _____ Representative _____

Configurations

- Horizontal
- “Z” pattern horizontal
- “N” pattern horizontal

Materials

- Housing & Sleeve: 304 (Schedule 40) Stainless Steel
- Elastomers: EPDM, Silicone and Buna ‘N’
- Link Checks: Noryl®, Stainless Steel
- Check Discs: Reversible Silicone or EPDM
- Test Cocks: Bronze Body Nickel Plated
- Pins & Fasteners: 300 Series Stainless Steel
- Springs: Stainless Steel

Available Models

Suffix:

OSY - UL/FM outside stem and yoke resilient seated gate valves

BFG - UL/FM grooved gear operated butterfly valves w/tamper switch

*OSY FxG - Flanged inlet gate connection and grooved outlet gate connection

*OSY GxF - Grooved inlet gate connection and flanged outlet gate connection

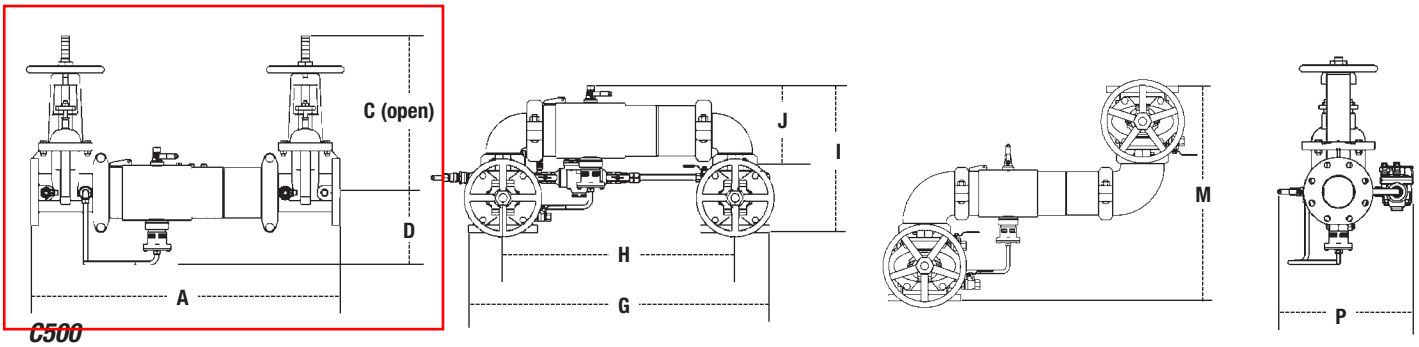
*OSY GxG - Grooved inlet gate connection and grooved outlet gate connection

Available with grooved NRS gate valves - consult factory*
Post indicator plate and operating nut available - consult factory*
*Consult factory for dimensions

Pressure — Temperature

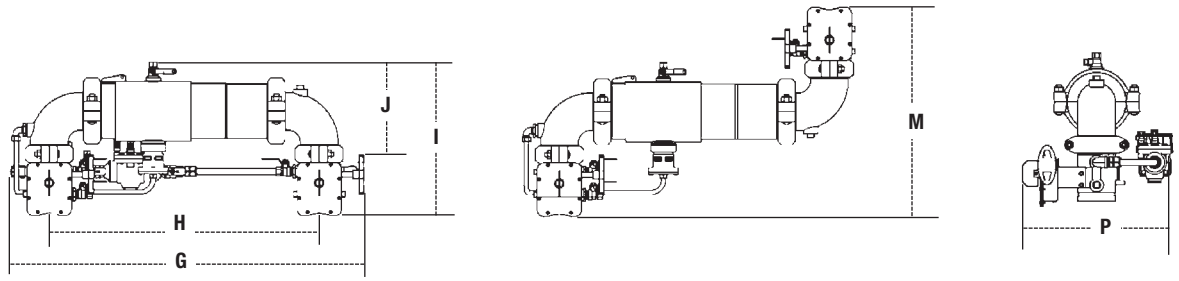
Temperature Range: 33°F – 140°F (0.5°C – 60°C)
Maximum Working Pressure: 175psi (12.1 bar)

Dimensions — Weights



C500

SIZE (DN)		DIMENSIONS																WEIGHT			
		A		C (OSY)		D		G		H		I		J		M		P		C500		C500N	
in.	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lbs.*	*kgs.*	*lbs.*	*kgs.*
2½	65	31	787	16⅜	416	6½	165	29 1/16	738	21½	546	15½	393	8 13/16	223	21 9/16	548	13 3/16	335	142	64	150	68
3	80	31 11/16	805	18⅞	479	6 11/16	170	30¼	768	22¼	565	17⅛	435	9 3/16	233	23⅛	587	14½	368	162	73	175	79
4	100	33½	851	22¾	578	7	178	33	838	23½	597	18½	470	9 15/16	252	26½	673	15 5/16	386	178	81	201	91
6	150	44	1118	30⅛	765	8½	216	44¾	1137	33¾	857	23 3/16	589	13 1/16	332	32¾	832	19	483	312	142	353	160
8	200	50	1270	37¾	959	9 1/16	246	54⅛	1375	40⅝	1032	27 7/16	697	15 11/16	399	37⅛	943	21 3/16	538	497	225	572	259
10	250	57½	1461	45¾	1162	11 3/16	285	66	1676	50	1270	32½	826	17 5/16	440	46⅜	1178	24	610	797	362	964	437



C500BFG

SIZE (DN)		DIMENSIONS												WEIGHT	
		G		H		I		J		M		P		C500BFG	
in.	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*in.*	*mm*	*lbs.*	*kgs.*
2½	65	32½	826	21½	546	15½	394	9½	241	21 13/16	555	15 13/16	402	81	37
3	80	34	864	22¼	565	16 5/16	414	10 1/16	256	23⅛	587	16⅛	410	84	38
4	100	35⅝	905	23½	597	17 3/16	437	10 15/16	279	24 15/16	634	16⅝	422	101	46
6	150	46½	1181	33¾	857	20½	521	13½	343	28¼	718	19	483	174	79

Noryl® is a registered trademark of SABIC Innovative Plastics™.

Approvals

1047

B64.5

For additional approval information please contact the factory or visit our website at www.amesfirewater.com

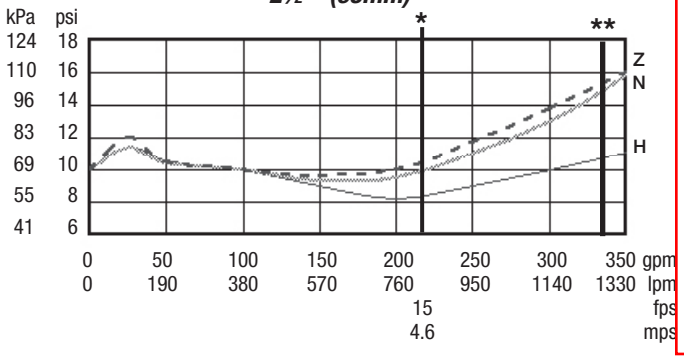
Capacity

UL/FM Certified Flow Characteristics
N&Z Flow characteristics collected using butterfly shutoff valves.
See literatue S-Colt-400, 500 for gate valve flow characteristics

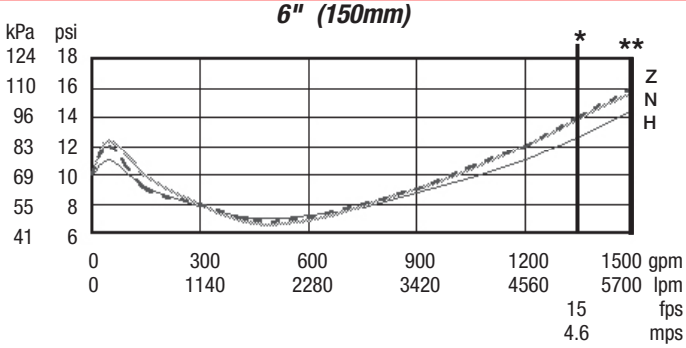
* = Rated Flow ** = UL Tested

Horizontal N - Pattern Z - Pattern

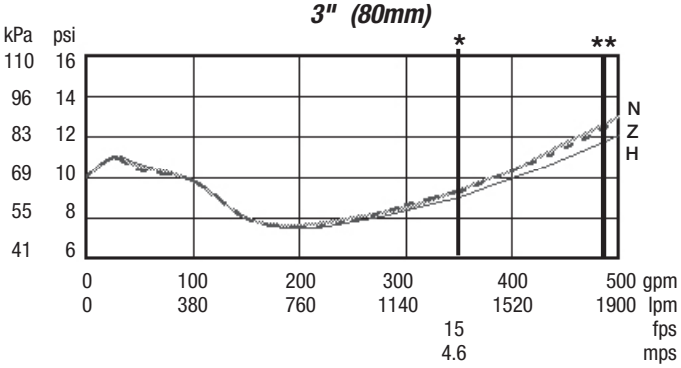
2½" (65mm)



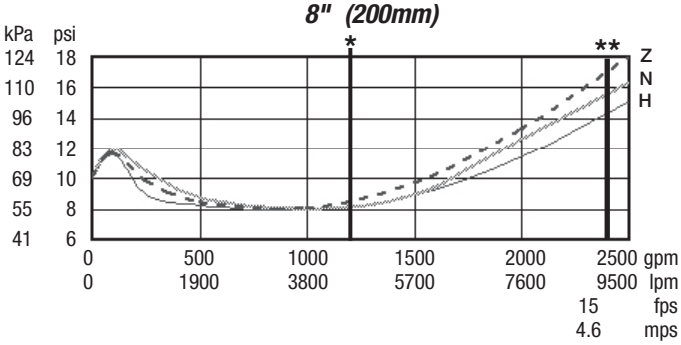
6" (150mm)



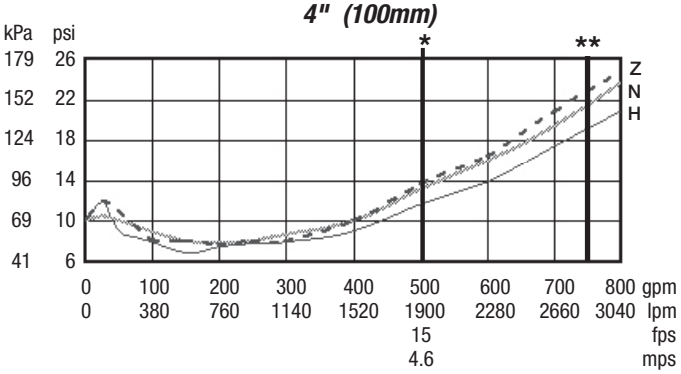
3" (80mm)



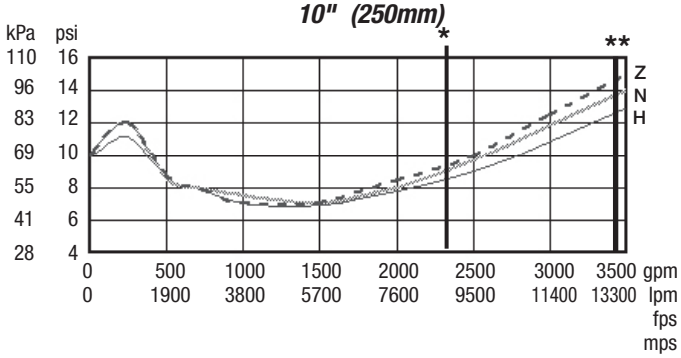
8" (200mm)



4" (100mm)



10" (250mm)



IMPORTANT: *INQUIRE WITH GOVERNING AUTHORITIES FOR LOCAL INSTALLATION REQUIREMENTS*

For additional information, visit our web site at: www.amesfirewater.com

AMES
FIRE & WATERWORKS

www.amesfirewater.com

ISO 9001-2008 CERTIFIED

A Watts Water Technologies Company

USA: Backflow- Tel: (916) 928-0123 • Fax: (916) 928-9333
Control Valves- Tel: (713) 943-0688 • Fax: (713) 944-9445
Canada: Tel: (905) 332-4090 • Fax: (905) 332-7068

ES-A-C500/C500N/C500Z 1151

FS-ONE
High Performance Intumescent Firestop Sealant

Product description

- Intumescent (expands when exposed to fire) firestop sealant that helps protect combustible and non-combustible penetrations for up to 4 hours fire rating

Areas of application

- Steel, copper and EMT pipes
- Insulated steel and copper pipes
- Cable bundles
- Closed or vented plastic pipes
- HVAC penetrations

For use with

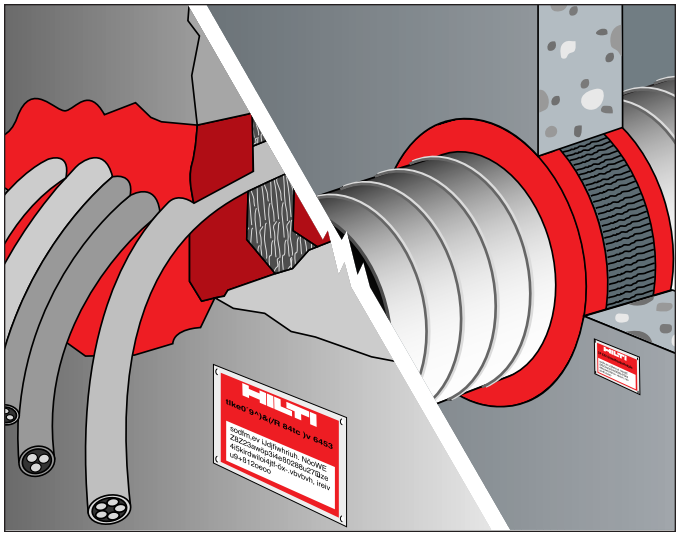
- Concrete, masonry, drywall and wood floor assemblies
- Wall and floor assemblies rated up to 4 hours

Examples

- Sealing around plastic pipe penetrations in fire rated construction
- Sealing around combustible and non-combustible penetrations in fire rated construction

System advantage/Customer benefits

- Protects most typical firestop penetration applications
- Easy to work with and fast cleanup
- Can be repenetrated when laying new cables
- Can be painted



Internationally tested and approved

CLASSIFIED UL

FILL, VOID OR CAVITY MATERIALS
CLASSIFIED BY
UNDERWRITERS LABORATORIES, INC.
FOR USE IN TROUGH-PENETRATION
FIRESTOP SYSTEMS
SEE UL FIRE RESISTANCE DIRECTORY
66Y7

FM
APPROVED
For Penetration Fire Stops.
Consult the Factory Mutual Research Corporation Approval Guide.

FS-ONE
Intumescent Firestop Sealant

Ordering Description	Color	Package contents	Volume	Item No.
FS-ONE, tube	**red**	**10.1 oz. (300 ml)**	**18 in³**	**00259579**
FS-ONE, foil	**red**	**(Qty 20) 20.2 oz. (600 ml)**	**36 in³**	**00311387**
FS-ONE, pail	**red**	**5 Gallons (19 liter)**	**1155 in³**	**00259578**
CB 200 PI-300/310 ml Dispenser				**00055205**
600 ml Foil Dispenser				**00024669**

FS-ONE
High Performance Intumescent Firestop Sealant

Product description

- Intumescent (expands when exposed to fire) firestop sealant that helps protect combustible and non-combustible penetrations for up to 4 hours fire rating

Product features

- Smoke, gas and water resistant
- Contains no halogen, solvents or asbestos
- High fire rating properties
- Water based, easy to clean

Tested in accordance with

- UL 1479
- ASTM E 814
- ASTM E 84

Technical Data

FS-ONE Intumescent Firestop

(at 73°F (23°C) and 50% relative humidity)

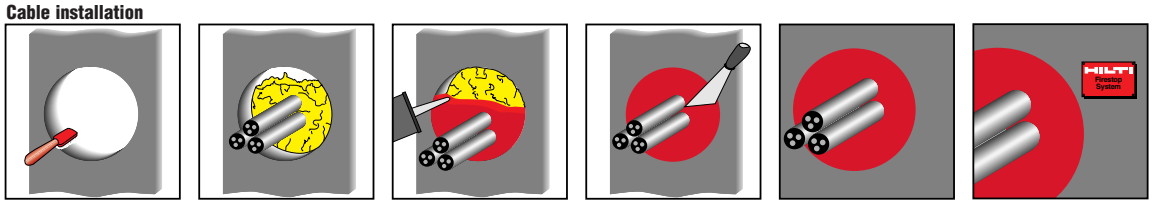
Chemical basis:	Water-based intumescent acrylic dispersion
Density:	Approx. 1.5 g/cm^3
Color:	Red
Working time:	Approx. 20-30 min
Curing time:	Approx. 14-21 days
Shore A Hardness:	Approx. 35
Movement capability:	Approx. 5%
Intumescent Activation:	Approx 250°F (121°C)
Expansion rate (unrestricted):	Up to 3-5 times original volume
Temperature resistance (cured):	-40°F (-40°C) to 212°F (100°C)
Application temperature:	35°F (2°C) to 100°F (38°C)
Surface burning characteristics: (ASTM E 84-96)	Flame Spread: 0 Smoke Development: 5
Sound transmission classification: ASTM E 90-97	50

Approvals

ICBO Evaluation Service, Inc.	Report No. 5071
California State Fire Marshal	Listing No. 1200:108
City of New York	MEA 326-96-M Vol. II

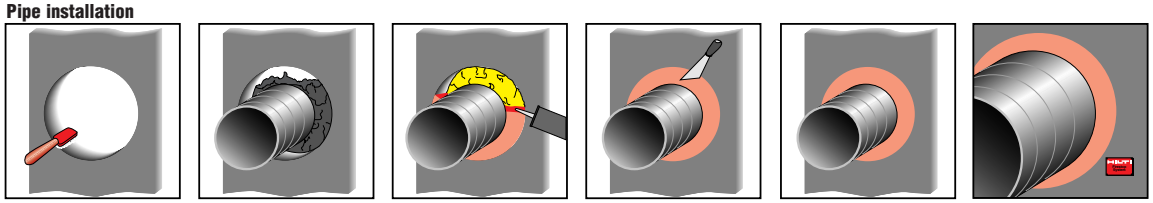
Installation instructions for FS-ONE

Cable installation



1. Clean opening. *2. Pack mineral wool. (If required)* *3. Apply FS-ONE.* *4. Smooth FS-ONE.* *5. Leave completed seal undisturbed for 48 hours.* *6. Fasten identification plate (if required).*

Pipe installation



1. Clean opening. *2. Pack mineral wool. (If required)* *3. Apply FS-ONE.* *4. Smooth FS-ONE.* *5. Leave completed seal undisturbed for 48 hours.* *6. Fasten identification plate (if required).*

Opening

1. Clean the opening. Surfaces to which FS-ONE will be applied should be cleaned of loose debris, dirt, oil, moisture, frost and wax. Structures supporting penetrating items must be installed in compliance with local building and electrical standards.

Application of firestop sealant

2. Install the prescribed backfilling material type and depth to obtain the desired rating (if required). Leave sufficient depth for applying FS-ONE.
3. Application of firestop sealant: Apply FS-ONE to the required depth in order to obtain the desired fire rating. Make sure FS-ONE contacts all surfaces to provide maximum adhesion. For application of FS-ONE use a standard caulking gun, foil pack gun, bulk loader and bulk gun. With FS-ONE buckets, Graco type sealant pumps may be used. (Contact pump manufacturer for proper selection).
4. Smoothing of firestop sealant: To complete the seal, tool immediately to give a smooth appearance. Excess sealant, prior to curing, can be cleaned away from adjacent surfaces and tools with water.
5. Leave completed seal undisturbed for 48 hours.
6. For maintenance reasons, a penetration seal could be permanently marked with an identification plate. In such a case, mark the identification plate and fasten it in a visible position next to the seal.

Notice about approvals

- Check that the penetration has been sealed according to the specified drawing in the UL Fire Resistance Directory or Hilti Firestop Manual. For further advice, please contact Hilti customer service. Refer to Hilti product literature and UL fire resistance directory for specific application details.

Not for use…

- High movement expansion joints
- Underwater
- On materials where oil, plasticizers or solvents may bleed i.e. impregnated wood, oil based seals, green or partially vulcanized rubber
- In any penetration other than those specifically described in this manual or the test reports

Safety precautions

- Before handling, read the product and Material Safety Data Sheet for detailed use and health information
- Keep out of reach of children
- Wear suitable gloves and eye protection

Storage

- Store only in the original packaging in a location protected from moisture at temperatures between 40°F (5°C) and 86°F (30°C)
- Observe expiration date on the packaging

HILTI, INC.: **P.O. Box 21148, Tulsa, OK 74121; Ph: 1 800 879 6000; Emergency No.: 1 800 879 4444**

PRODUCT NAME: **FS-ONE High Performance Intumescent Firestop Sealant**

DESCRIPTION: **One-part acrylic-based sealant**

MSDS No.: 259
Revision No.: 008
Date: 05/19/99

INGREDIENTS AND EXPOSURE LIMITS

Ingredients:	*CAS Number:*	*PEL:*	*TLV:*	*TEL:*
Calcium carbonate	01317-65-3	5 mg/m³ (T)	10 mg/m³ (T)	NE
Ammonium polyphosphate	68333-79-9	NE	NE	NE
Boron trioxide	01303-86-2	15 mg/m³ (R)	10 mg/m³	NE
Alkylphenolethersulfate, sodium salt	69011-84-3	NE	NE	NE
Talc	14807-96-6	20 mppcf	2 mg/m³	NE
Zinc oxide	01314-13-2	5 mg/m³ (T)	10 mg/m³	NE
Expandable graphite	12777-87-6	5 mg/m³ (T)	2 mg/m³ (T)	NE
Ethylene glycol	00107-21-1	NE	C:100 mg/m³ (A)	NE
Polybutene	09003-29-6	NE	NE	NE
Iron oxide	01309-37-1	10 mg/m³	5 mg/m³	NE
Glass filament	65997-17-3	NE	5 mg/m³ (T)	NE
Silicon dioxide	14808-60-7	0.05 mg/m³ (T)	0.1 mg/m³ (T)	NE

Abbreviations: PEL = OSHA Permissible Exposure Limit. TLV = ACGIH Threshold Limit Value. C = Ceiling. STEL = Short Term Exposure Limit. NE = None Established. NA = Not Applicable. (T) indicates “as total dust”. (R) indicates “as respirable fraction”. (A) indicates “as an aerosol”. mppcf = million particles per cubic foot.

PHYSICAL DATA

Appearance:	Red paste.	Odor:	Odorless.
Vapor Density: (air = 1)	Not determined.	Vapor Pressure:	23mbar @ 20C / 68F
Boiling Point:	Not applicable.	VOC Content:	None.
Evaporation Rate:	Not applicable.	Solubility in Water:	Soluble.
Specific Gravity:	1.5	pH:	Notdetermined.

FIRE AND EXPLOSION HAZARD DATA

Flash Point:	Non-flammable.
Flammable Limits:	Not applicable.
Extinguishing Media:	Not applicable. Use extinguishing media as appropriate for surrounding fire.
Special Fire Fighting Procedures:	None known. Use a self-contained breathing apparatus when fighting fires involving chemicals.
Unusual Fire and Explosion Hazards:	None known. Thermal decomposition products can be formed.

REACTIVITY DATA

Stability:	Stable.
Hazardous Polymerization:	Will not occur.
Incompatibility:	Strong acids, peroxides, and oxidizing agents.
Decomposition Products:	Thermal decomposition can yield CO and CO2.
Conditions to Avoid:	None known.

HEALTH HAZARD DATA

Known Hazards:	None known.
Carcinogenicity:	IARC classifies crystalline silica (quartz sand) as Gp I based upon evidence among workers in industries where there has been long-term and chronic exposure (via inhalation) to silica dust; e.g. mining, quarry, stone crushing, refractory brick and pottery workers. This product does not pose a dust hazard; therefore, this classification is not relevant. Based upon the nature and intended use of this product, it does not pose an increased cancer risk to workers.

Signs and Symptoms of Exposure:	Possibly irritating upon contact with the eyes or upon repeated contact with the skin.
Routes of Exposure:	Dermal.
Medical Conditions Aggravated by Exposure:	Eye and skin conditions.

EMERGENCY AND FIRST AID PROCEDURES

Eyes:	Immediately flush with plenty of water. Call a physician if symptoms occur.
Skin:	Immediately wipe off material and wash with soap and water. Material can adhere to the skin. If material has adhered to the skin, use an abrasive containing hand cleaner. If material does not come off, buff with a pumice stone.
Inhalation:	Move victim to fresh air if discomfort develops. Call a physician if symptoms persist.
Ingestion:	Seek medical attention. Do not induce vomiting unless directed by a physician. Never give anything by mouth to an unconscious person.
Other:	Referral to a physician is recommended if there is any question about the seriousness of the injury/exposure.

CONTROL MEASURES AND PERSONAL PROTECTIVE EQUIPMENT

Ventilation:	General (natural or mechanically induced fresh air movements).
Eye Protection:	Not required, however, safety glasses should be worn in most industrial settings.
Skin Protection:	Avoid skin contact. Cloth gloves are suitable for hand protection.
Respiratory Protection:	None normally required. Where ventilation is inadequate to control vapors, use a NIOSH-approved respirator with organic vapor cartridges. Never enter a confined space without an appropriate air-supplied respirator.

PRECAUTIONS FOR SAFE HANDLING AND USE

Handling and Storing Precautions:	Store in a cool, dry area preferably between 50° and 100° F. Keep from freezing. Do not store in direct sunlight. Avoid contact with the eyes or skin. Practice good hygiene; i.e. always wash thoroughly after handling and before eating or smoking. For industrial use only. Keep out of reach of children. Follow label/use instructions.
Spill Procedures:	Immediately wipe away spilled material before it hardens. Place in a container for proper disposal in accordance with all applicable local, state, or federal requirements.

REGULATORY INFORMATION

Hazard Communication:	This MSDS has been prepared in accordance with the federal OSHA Hazard Communication Standard 29 CFR 1910.1200.
HMIS Codes:	Health 1, Flammability 0, Reactivity 0, PPE B
DOT Shipping Name:	Not regulated.
TSCA Inventory Status:	Chemical components listed on TSCA inventory.
SARA Title III, Section 313:	This product contains 1-5% ethylene glycol (CAS 107-21-1) and 1-5% zinc oxide (re: zinc compounds) which are subject to reporting under Section 313 of SARA Title III (40 CFR Part 372).
EPA Waste Code(s):	Not regulated by EPA as a hazardous waste.
Waste Disposal Methods:	Consult with regulatory agencies or your corporate personnel for disposal methods that comply with local, state, and federal safety, health and environmental regulations.

CONTACTS

Customer Service:	1 800 879 8000
Technical Service:	1 800 879 8000
Emergency:	1 800 879 4444
Health / Safety:	1 800 879 6000 Steve Gerrard (x6309) Jerry Metcalf (x6704)

The information and recommendations contained herein are based upon data believed to be correct; however, no guarantee or warranty of any kind expressed or implied is made with respect to the information provided.

Underwriters Laboratories Inc.®

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CERTIFICATE OF COMPLIANCE

CERTIFICATE NUMBER: 211097 - R13240A
ISSUE DATE: October 21, 1997

Issued to: Hilti Construction Chemicals Inc.
5400 S. 122nd East Avenue
Tulsa, OK 74146 USA

Report Reference: R13240, February 14, 1997

This is to Certify that representative samples of: Fill, Void or Cavity Materials, one part Sealant designated as FS One (also identified as CP 612)

Have been investigated by Underwriters Laboratories Inc. in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: UL 1479, Fire Tests of Through-Penetration Firestops;

UL 2079, Tests for Fire Resistance of Building Joint Systems.

Additional Information:

This material is a one part intumescent firestop sealant for use in through-penetration firestop systems. These sealants are Classified as "Fill, Void or Cavity Materials" for use in various Through-Penetration Firestop Systems as specified in Volume 2 of UL's Fire Resistance Directory.

Only those products bearing the UL Classification Marking should be considered as being covered by UL's Classification and Follow-Up Service.

The UL Classification Marking includes: the name "Underwriters Laboratories Inc."; the word "Classified"; a control number (may be alphanumeric) assigned by UL; a statement to indicate the extent of UL's evaluation of the product; and, the product category name (product identity) as indicated in the appropriate UL Directory.

LOOK FOR THE UL CLASSIFICATION MARKING ON THE PRODUCT

Engineer: Underwriters Laboratories Inc.
Nikola Momcilovic

Review Engineer: Underwriters Laboratories Inc.
A. M. Ramirez

2000-44C (6/92)