



## Model G Automatic Sprinklers Spray Upright, Spray Pendent, And Conventional

Reviewed for Code Compliance  
Kitsap County Building/ Fire Marshals  
11/17/2020 2:28:55 PM kwlodarchak

### Product Description

The Reliable Model G Automatic Sprinkler utilizes the center strut solder in compression principle of construction. The fusible alloy is captured in the cylinder of the solder capsule by a stainless steel ball. When the fusible alloy melts, the ball moves into the cylinder allowing the cylinder to fall away from the sprinkler. When this happens, the lever is released to spring free from the sprinkler so that all of the operating parts clear from the waterway allowing the deflector to distribute the discharging water.

Except for the parts in the cylinder as mentioned above, the sprinkler components are made from copper based alloys for maximum corrosion protection. Lead plated, wax coated or wax over lead plated sprinklers are available for specially severe environments. Chrome plated sprinklers are available for decorative purposes.

All sprinklers are individually hydrostatically tested. All sprinklers are identified as to their fusing point by markings that appear on several of the operating parts and by an identifying color that appears on the frame.

### Sprinkler Types

**Standard Upright** – This deflector configuration is normally used with exposed piping installations. Water is distributed laterally and downward in a wide pattern approximating a hemisphere which is completely and uniformly filled with water in the form of small drops or spray.

**Standard Pendent** – This deflector configuration is normally used where the space above the piping is limited or where a concealed piping installation is employed. The discharge characteristics of the standard pendent are virtually identical to the standard upright as described above.

**Large and Small Orifice** – By varying the orifice size, a large or small orifice sprinkler is created that will distribute as much as 40% more water or 65% less water than the normal 1/2" (15mm) orifice sprinkler.

**Conventional** – This deflector configuration is used primarily in those countries where the LPC installation rules have precedence. The sprinkler is designed to distribute a portion of its water discharge upward against the ceiling with the balance downward. It may be installed in either the upright or the pendent position. Sprinklers with conventional deflectors are available with orifice sizes corresponding to light, ordinary and extra-high hazard installations.



Upright



Pendent



Small Orifice Upright



Conventional

### Application and Installation

Standard sprinklers are used in fixed fire protection systems: Wet, Dry, Deluge or Preaction. Care must be exercised that the orifice sizes, temperature ratings, deflector styles and sprinkler spacings are in accordance with the latest published standards of the National Fire Protection Association or the approving authority having jurisdiction.

The sprinklers must be installed with the Reliable Model D Sprinkler Wrench. Any other type of wrench may damage the sprinkler.

The approvals or listings of Reliable Automatic Sprinklers by major approving organizations are shown in the tabulated list provided on the back of this bulletin.

## Technical Data

Sprinkler Type	“K” Factor		Sprinkler Height	Approvals	Sprinkler Identification Number (SIN)	
	US	Metric			SSU	SSP
Standard—Upright (SSU) and Pendent (SSP) Deflectors Marked to Indicate Position						
1/2" (15 mm) Standard Orifice with 1/2" NPT (R <sup>1/2</sup> ) Thread	5.62	81.0	2 7/8" (73 mm)	1, 2, 3, 4, 5, 6	R1025	R1015
7/16" (11 mm) Small Orifice with 1/2" NPT (R <sup>1/2</sup> ) Thread	4.24	61.0	2 7/8" (73 mm)	1	R1023	R1013
3/8" (10 mm) Small Orifice with 1/2" NPT (R <sup>1/2</sup> ) Thread	2.82	40.6	2 7/8" (73 mm)	1, 2,	R1021	R1011
5/16" (8 mm) Small Orifice with 1/2" NPT (R <sup>1/2</sup> ) Thread	1.98	28.5	2 7/8" (73 mm)	1, 5	R1022	R1012
17/32" (20 mm) Large Orifice with 1/2" NPT (R <sup>1/2</sup> ) Thread	7.96	114.7	2 7/8" (73 mm)	1, 2,	R1026	R1016
17/32" (20 mm) Large Orifice with 3/4" NPT (R <sup>3/4</sup> ) Thread	8.20	118.2	2 15/16" (75 mm)	1, 2,	R1027	R1017
20 mm XHH with 20 mm Thread	8.20	118.2	75.4 mm	3, 4,	R1027	R1017
10 mm XLH with 10 mm Thread	4.10	59.1	73 mm	3, 4,	R1024	R1014
Conventional—Installed in Upright or Pendent Position						
10mm XLH with 10mm Thread	4.10	59.1	73 mm	4	R1074	
15mm Standard Orifice with (R <sup>1/2</sup> ) Thread	5.62	81.0	73 mm	3, 4, 6	R1075	
20mm XHH with (R <sup>3/4</sup> ) Thread	8.20	118.2	75.4 mm	3, 4	R1077	

## Temperature Ratings

Classification	Sprinkler Rating		Maximum Ambient Temperature		Frame <sup>(1)</sup> Color
	°F	°C	°F	°C	
Ordinary	135	57	100	38	Black
Ordinary	165	74	100	38	Uncolored
Intermediate	212	100	150	66	White
High	286	141	225	107	Blue

<sup>(1)</sup> Frame color does not apply to painted or plated sprinklers

—Use sprinkler rating as identified on operating parts.

## Finishes <sup>(1)</sup>

Standard Finishes	
Bronze	—All Temperature Ratings
Chrome	—All Temperature Ratings
White <sup>(2)</sup>	—All Temperature Ratings
	Only Frame and Deflector are Painted
Special Application Finishes	
Bright Brass Plated	—Only frame, deflector and cap are plated. 135°F (57°C), 165°F (74°C), 212°F (100°C) Temp. Rating.
Black Plated	—Only frame, deflector and cap are plated. All Temp. Ratings.
Polyester Coated <sup>(2)(4)</sup>	—Only frame and deflector are coated.
Lead Plated	—165°F (74°C), 212°F (100°C) and 286°F (141°C) Temp. Ratings.
Wax-Coated <sup>(3)</sup>	—165°F (74°C) Clear Wax, 212°F (100°C) Brown Wax.
Wax-Coated Over Lead Plated <sup>(3)</sup>	—165°F (74°C) Clear Wax, 212°F (100°C) Brown Wax.

<sup>(1)</sup> Other colors and finishes are available. Consult factory for details.

<sup>(2)</sup> UL listed and NYC MEA Approved only.

<sup>(3)</sup> 212°F (100°C) brown wax may be used on 286°F (141°C) sprinklers when maximum ambient temperatures do not exceed 150°F (66°C). UL Listed, FM Approved, NYC MEA 258-93-E.

<sup>(4)</sup> FM Approved for R1027 only.

## Maintenance

Model G Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Remove any sprinkler that has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation. Use only the Model D Sprinkler Wrench for sprinkler removal and installation. Any other type of wrench may damage the sprinkler.

## Approval Organizations

- Underwriters Laboratories, Inc. and UL Certified for Canada (cULus).
- Factory Mutual Research Corporation
- Loss Prevention Council
- Pleniére Assemblée
- N.Y.C. BS&A No. 587-75-SA or N.Y.C. MEA 258-93-E
- EC Certificate: 1438-CPD-0054 (R1015)  
1438-CPD-0053 (R1025)  
1438-CPD-0052 (R1075)  
1438-CPD-0056 (R1077)

## Ordering Information

### Specify:

- Model G
- Deflector
  - Upright
  - Pendent
  - Conventional
- Nominal Orifice
- Inlet Thread
- Temperature Rating
- Finish

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable. Products manufactured and distributed by Reliable have been protecting life and property for over 90 years.

Manufactured by



**Reliable Automatic Sprinkler Co., Inc.**

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**Permit Number: 19-04603**

# Reliable®

## Model G Sidewall Model G/F1 Recessed Sidewall Sprinklers

### A Complete Line of Sidewall Sprinklers

1. Model G Vertical Sidewall-Upright.
2. Model G Vertical Sidewall-Pendent.
3. Model G Horizontal Sidewall-HSW1 Deflector.
4. Model G/F1/HSW1 Recessed Horizontal Sidewall-HSW1 Deflector.
5. Model G Extended Coverage Horizontal Sidewall-EC4 Deflector.
6. Model G/F1/EC4 Recessed Extended Coverage Horizontal Sidewall-EC4 Deflector.
7. Variety of finishes.
8. Multiple orifice sizes.

### Product Description

All Reliable Model G Automatic Sidewall Sprinklers utilize the center strut in compression principle of construction. The fusible alloy, retained in the cylinder of a small solder capsule by a stainless steel ball, acts as the trigger of the sprinkler. When the fusible alloy melts, the sprinkler operating parts spring free from the sprinkler, clearing the water way and allowing the sprinkler to distribute the discharging water.

### Sidewall Sprinkler Types:

#### Model G Vertical Sidewall Sprinkler

The Model G Vertical Sidewall Sprinkler is designed for use in light hazard situations where standard sprinklers are deemed impractical because of decorative or structural conditions. It discharges approximately 15% of the water on the wall behind it with the remaining 85% discharged in front of the sprinkler. This sprinkler may be in stalled in either the Upright or the Pendent position.

#### Model G Horizontal Sidewall Sprinkler— HSW1 Deflector

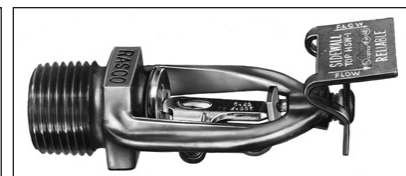
This deflector configuration is designed and listed for use in either light or ordinary hazard occupancies. The use of the Model G Horizontal Sidewall Sprinkler in ordinary hazard occupancies will provide installation simplicities and economies in many circumstances.

#### Model G/F1/HSW1 Recessed Horizontal Sidewall Sprinkler-HSW1 Deflector

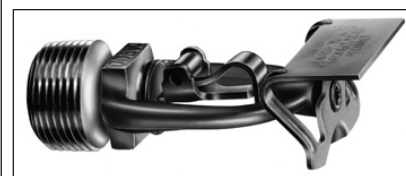
The combination of the Model F1 Recessed Escutcheon and the Model G Horizontal Sidewall Sprinkler-HSW1 Deflector provides a very attractive recessed sprinkler for use in light hazard occupancies.



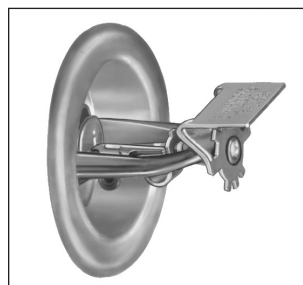
Model G  
Vertical Upright



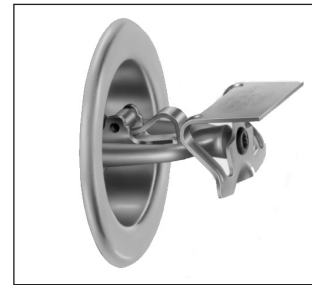
Model G Horizontal-HSW1



Model G Horizontal  
Extended Coverage-EC4



Model G/F1/EC4  
Recessed Horizontal  
Extended Coverage-EC4



Model G/F1/HSW1  
Recessed  
Horizontal-HSW1

#### Model G Extended Coverage Horizontal Sidewall Sprinkler-EC4 Deflector

The Model G Extended Coverage Sprinkler is listed for the protection of larger than normal areas in light hazard occupancies.

#### Model G/F1/EC4 Recessed Extended Coverage Horizontal Sidewall Sprinkler-EC4 Deflector

The combination of the Model F1 Recessed Escutcheon and the 17/32" (20mm) orifice x 3/4" NPT (R3/4) Model G Horizontal Sidewall Sprinkler-EC4 Deflector provides a very attractive recessed sprinkler for use in larger than normal areas in light hazard occupancies.

## Model G Extended Coverage Horizontal Sidewall Sprinkler — EC4 Deflector

### Technical Data

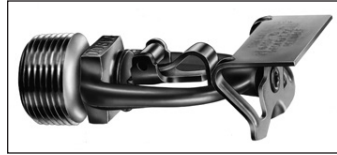
Length:

3<sup>5</sup>/<sub>16</sub>" (84mm) - 1<sup>1</sup>/<sub>2</sub>" (15mm) Orifice Sprinkler

3<sup>17</sup>/<sub>32</sub>" (90mm) - 1<sup>7</sup>/<sub>32</sub>" (20mm) Orifice Sprinkler

Rating: 135°F (57°C)

Max. Ambient Temp. 100°F (38°C)



### Approval Type:

Extended Coverage-Light Hazard Occupancy.

### Approvals:

Underwriters Laboratories Inc. NYC BS&A No 587-75-SA

Underwriters' Laboratories of Canada

### Installation Wrench:

Model D Sprinkler Wrench or Model W2 Sprinkler Wrench

### Color Identification:

Black Paint (Bronze Finish Only).

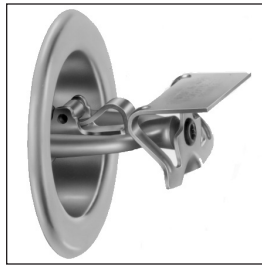
### Ceiling to Deflector Distance:

6 to 12 inches (152mm to 305mm).

### Technical Data

Nominal Orifice	Thread Size	K Factor		Flow Rate gpm (L/min)	Pressure psi (bar)	Coverage Area Width x Length ft. x ft (m x m)	Sprinkler Ident. Number (SIN)
		US	Metric				
1 <sup>1</sup> / <sub>2</sub> " (15mm)	1 <sup>1</sup> / <sub>2</sub> " (R <sup>1</sup> / <sub>2</sub> )	5.62	81.0	30 (113.5)	28.5 (2.0)	16 x 18 (4.9 x 5.5)	R1265
1 <sup>1</sup> / <sub>2</sub> " (15mm)	1 <sup>1</sup> / <sub>2</sub> " (R <sup>1</sup> / <sub>2</sub> )	5.62	81.0	38 (143.8)	45.7 (3.2)	16 x 20 (4.9 x 6.0)	R1265
1 <sup>7</sup> / <sub>32</sub> " (20mm)	3 <sup>4</sup> / <sub>4</sub> " (R <sup>3</sup> / <sub>4</sub> )	8.20	118.2	30 (113.5)	13.4 (0.9)	16 x 18 (4.9 x 5.5)	R1267
1 <sup>7</sup> / <sub>32</sub> " (20mm)	3 <sup>4</sup> / <sub>4</sub> " (R <sup>3</sup> / <sub>4</sub> )	8.20	118.2	32 (121.1)	15.2 (1.0)	16 x 20 (4.9 x 6.0)	R1267
1 <sup>7</sup> / <sub>32</sub> " (20mm)	3 <sup>4</sup> / <sub>4</sub> " (R <sup>3</sup> / <sub>4</sub> )	8.20	118.2	37 (140.0)	20.0 (1.4)	16 x 22 (4.9 x 6.7)	R1267
1 <sup>7</sup> / <sub>32</sub> " (20mm)	3 <sup>4</sup> / <sub>4</sub> " (R <sup>3</sup> / <sub>4</sub> )	8.20	118.2	39 (147.6)	22.6 (1.6)	16 x 24 (4.9 x 7.3)	R1267

## Model G/F1/EC4 Extended Coverage Horizontal Sidewall Sprinkler — EC4 Deflector



### Technical Data

Nominal Orifice: 1<sup>7</sup>/<sub>32</sub>" (20mm)

Thread Size: 3<sup>4</sup>/<sub>4</sub>" NPT (R<sup>3</sup>/<sub>4</sub>)

K Factor: 8.20 US (118.2 Metric)

Length: 3<sup>17</sup>/<sub>32</sub>" (90mm)

Rating: 135°F (57°C)

Max. Ambient Temp.: 100°F (38°C)

### Approval Type:

Extended Coverage-Light Hazard Occupancy.

### Approvals:

Underwriters Laboratories Inc. NYC BS&A No 587-75-SA

Underwriters' Laboratories of Canada

### Installation Wrench:

Model GFR1 Sprinkler Wrench.

### Color Identification:

Black Paint (Bronze Finish Only).

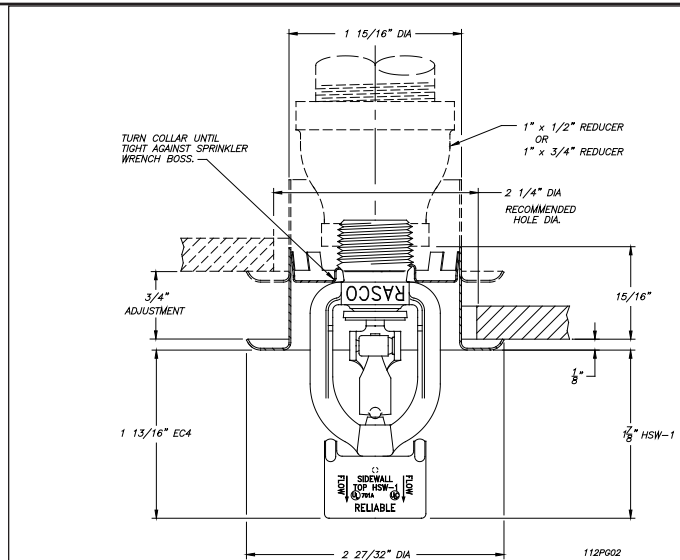
### Technical Data

Flow Rate gpm (L/min)	Pressure psi (bar)	Coverage Area Width x Length ft. x ft (m x m)	Deflector to Ceiling Dimension Min. - Max. in. (mm)	Sprinkler Ident. Number (SIN)
30 (113.5)	13.4 (0.9)	16 x 18 (4.9 x 4.9)	6 - 12 (152 - 305)	R1267
32 (121.1)	15.2 (1.0)	16 x 20 (4.9 x 6.0)	6 - 12 (152 - 305)	
37 (140.0)	20.0 (1.4)	16 x 22 (4.9 x 6.7)	6 - 12 (152 - 305)	

Model G/F1/EC4

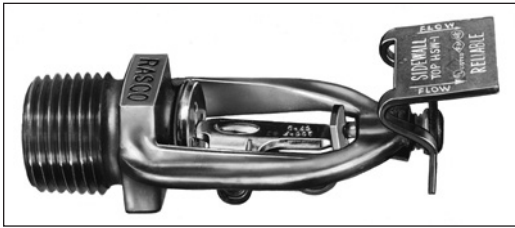
Model G/F1/HSW1

Recessed Sidewall Sprinkler





## MODEL G HORIZONTAL SIDEWALL SPRINKLER — HSW1 Deflector



### Installation Wrench:

Model D Sprinkler Wrench or Model W2 Sprinkler Wrench

### Ceiling to deflector distance:

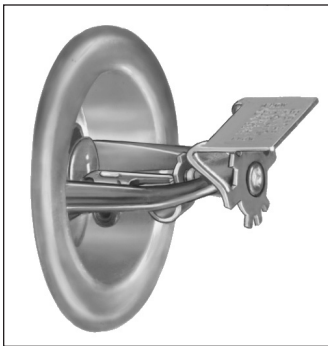
4 to 6 Inches (102mm to 152mm).

### Technical Data

Nominal Orifice	Thread Size	K Factor		Sprinkler Length	Approval Organizations		Sprinkler Ident. Number (SIN)
		US	Metric		Light Hazard	Ordinary Hazard	
1/2" (15mm)	1/2" (R1/2)	5.62	81.0	3 5/16" (84mm)	1, 2, 3, 4, 5, 6	1, 3, 5, 6	R1235
7/16" <sup>(1)</sup> (11mm)	1/2" (R1/2)	4.24	61.0	3 5/16" (84mm)	1, 3, 5, 6	--	R1233
3/8" <sup>(1)</sup> (10mm)	1/2" (R3/4)	2.82	40.6	3 5/16" (84mm)	1, 3, 5, 6	--	R1231
17/32" (20mm)	3/4" (R3/4)	8.20	118.2	3 5/16" (84mm)	1, 3, 5, 6	--	R1237
17/32" <sup>(1)</sup> (20mm)	1/2" (R3/4)	7.96	114.7	3 5/16" (84mm)	1, 3, 5, 6	--	R1236

<sup>(1)</sup> Identified by pintle extending beyond deflector.

## Model G/F1/HSW1 Recessed Horizontal Sidewall Sprinkler — HSW1 Deflector



Rating: 135°F (57°C)

Max. Ambient Temp.: 100°F (38°C)

Underwriters Laboratories Inc.

Length: 3 5/16" (84mm)

Approval Type: Light Hazard Occupancy

### Approvals:

Underwriters Laboratories Inc.

NYC BS&A No 587-75-SA

Underwriters' Laboratories of Canada

### Installation Wrench:

Model GFR1 Sprinkler Wrench.

### Color Identification:

Black Paint (Bronze Finish Only).

### Ceiling to Deflector Distance:

4 to 6 inches (102mm to 152mm).

### Technical Data

Nominal Orifice	Thread Size	K Factor		Sprinkler Ident. Number (SIN)
		US	Metric	
1/2" (15mm)	1/2" (R1/2)	5.62	81.0	R1235
7/16" (11mm)	1/2" (R3/4)	4.24	61.0	R1233

<sup>(1)</sup> Identified by pintle beyond deflector.

## MODEL G VERTICAL SIDEWALL SPRINKLER



### Installation Wrench:

Model D Sprinkler Wrench or Model W2 Sprinkler Wrench

### Installation Position:

Upright or Pendent

### Approval Type:

Light Hazard Occupancy

### Ceiling to Deflector Distance:

4 to 6 inches (102mm to 152mm).

### Wall to Deflector Distance:

4 to 6 inches (102mm to 150 mm).

### Technical Data

Nominal Orifice	Thread Size	K Factor		Sprinkler Length	Approval Organizations	Sprinkler Ident. Number (SIN)
		US	Metric			
1/2" (15mm)	1/2" (R1/2)	5.62	81.0	2 7/8" (73mm)	2, 4	R1285

## Temperature ratings and finishes for Model G Horizontal Sidewall— HSW1 Deflector and Vertical Sidewall Sprinklers

Sprinkler		Maximum Ambient Temperature		Frame Color*
°F	°C	°F	°C	
135	57	100	38	Black
165	74	100	38	Uncolored
212	100	150	66	White
286	141	225	107	Blue

### Approval Organizations:

1. Underwriters Laboratories, Inc.
2. Factory Mutual Research Corp.
3. Underwriters' Laboratories of Canada
4. LPCB
5. NYC BS&A No. 587-75-SA
6. NYC MEA 258-93-E

\* Frame color does not apply to plated or painted sprinklers.

### Finishes <sup>(1)</sup>

Standard Finishes	
Sprinkler	Escutcheon
Bronze Chrome Plated	Bronze Chrome Plated
Special application Finishes	
Sprinkler	Escutcheon
Bright Brass <sup>(2)</sup> Black Plated <sup>(2)</sup> Satin Chrome Lead Plated - 165°F (74°C), 212°F (100°C) and 286°F (141°C) Ratings Wax Coated - 165°F (74°C) Clear Wax, 212°F (100°C) Brown Wax <sup>(3)</sup> Wax Over Lead Plated - 165°F (74°C) Clear Wax, 212°F (100°C) Brown Wax <sup>(3)</sup>	Bright Brass Black Plated Satin Chrome

<sup>(1)</sup> Other colors and finishes are available. Consult factory for details.

<sup>(2)</sup> Only frame, deflector and cap are plated.

<sup>(3)</sup> 212°F (100°C) brown wax may be used on 286°F (141°C) sprinklers when maximum ceiling temperatures do not exceed 150°F (66°C). UL Listed only.

## Ordering Information:

Specify:

1. Model  
G or G/F1
2. Recessed  
(Only G/F1)
3. Deflector
  - Vertical Sidewall Deflector
  - Horizontal Sidewall - HSW1 Deflector
  - Horizontal Sidewall - EC4 Deflector
4. Nominal Orifice
5. Inlet Thread
6. Temperature Rating
7. Sprinkler Finish
8. Escutcheon Finish

**NOTE:** Sprinkler and escutcheon are packaged separately.

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable. Products manufactured and distributed by Reliable have been protecting life and property for over 90 years.

Manufactured by



### Reliable Automatic Sprinkler Co., Inc.

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**Permit Number: 19-04603**

# Reliable®

## Model F1FR Series Quick Response Glass Bulb Sprinklers

### Model F1FR56 Sprinkler Types

Standard Spray Upright  
Standard Spray Pendent  
Conventional Upright/Pendent  
Vertical Sidewall  
Horizontal Sidewall

### Model F1FR56 Recessed Sprinkler Types

Standard Spray Pendent  
Horizontal Sidewall

### Model F1FR56 Concealed Sprinkler Types

Standard Spray Pendent

### Model F1FR42, F1FRXLH & F1FR28 Sprinkler Types

Standard Spray Upright  
Standard Spray Pendent

### Model F1FR40 Sprinkler Types

Standard Spray Pendent

### Model F1FR42, F1FR40, F1FRXLH & F1FR28 Recessed Sprinkler Types

Standard Spray Pendent

### Model F1FR56LL & F1FR42LL Low Lead Sprinkler Types

Standard Spray Pendent with less than 0.25% Lead Content

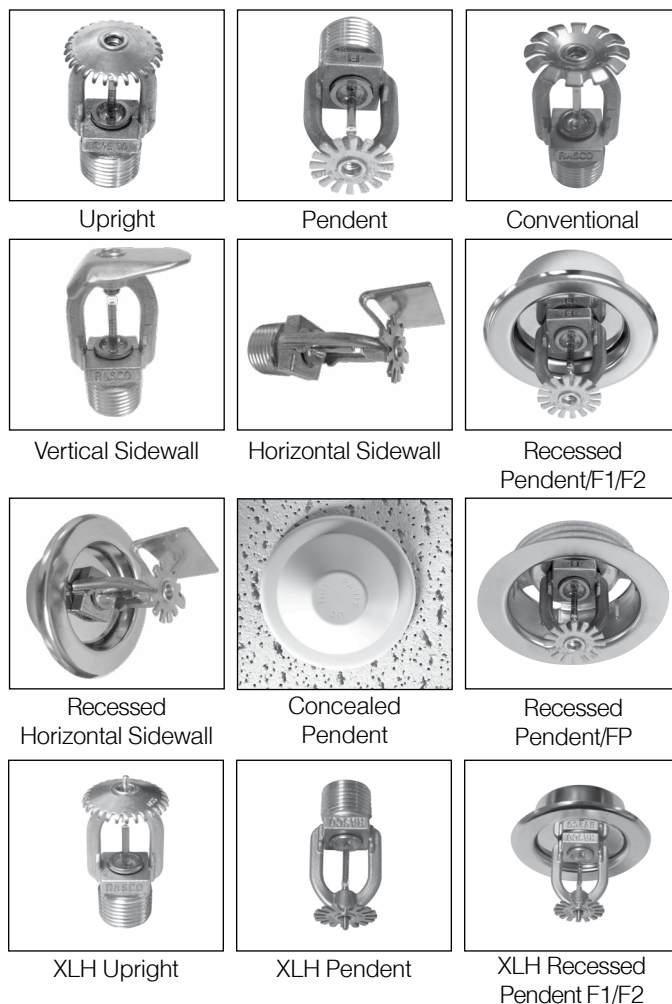
### Listing & Approvals

The following organizations provide Listings or Approvals for various Model F1FR series sprinklers. See the Design and Installation table in this Bulletin for information on specific listings and approvals applicable to each sprinkler.

1. Underwriters Laboratories Inc. and Certified for Canada (cULus) in accordance with ANSI/UL199.
2. FM Approvals (FM)
3. Loss Prevention Certification Board (LPCB)
4. VdS Schadenverhütung GmbH (VdS)
5. Underwriters Laboratories Inc. and Underwriters Laboratories of Canada Certified for Health Effects to NSF/ANSI Standard 61 Annex G (ULH)
6. EC Certificate: 0786-CPD-40239 (RA1414), 0786-CPD-40251 (RA1425), 0786-CPD-40252 (RA1475) (EC)

### UL Listing Category

Sprinklers, Automatic & Open (VNIV)  
Quick Response Sprinkler



### Product Description

Reliable Model F1FR series sprinklers are quick-response automatic sprinklers with a glass bulb thermal element. Model F1FR series sprinklers are Standard Spray sprinklers, with the exception of the Model F1FR56 Conventional sprinkler which is an Old-style/Conventional sprinkler.

The Model F1FR Series automatic sprinklers utilize a 3.0 mm frangible glass bulb. These sprinklers have demonstrated response times in laboratory tests which are five to ten times faster than standard response sprinklers. This quick response enables the Model F1FR Series sprinklers to apply water to a fire faster than standard-response sprinklers of the same temperature rating.

The glass bulb consists of an accurately controlled amount of special fluid hermetically sealed inside a precisely manufactured glass capsule. This glass bulb is specially constructed to provide fast thermal response.



XLH Recessed Pendent FP

At normal temperatures, the glass bulb contains the fluid in both the liquid and vapor phases. The vapor phase can be seen as a small bubble. As heat is applied, the liquid expands, forcing the bubble smaller and smaller as the liquid pressure increases. Continued heating forces the liquid to push out against the bulb, causing the glass to shatter, opening the waterway and allowing the deflector to distribute the discharging water.

Model F1FR Series sprinklers provide a wide range of options where quick-response, glass bulb sprinklers are used:

- Pendent, recessed pendent, upright, horizontal sidewall, and vertical sidewall deflectors
- K-factors of 2.8 (40 metric), 4.0 (57 metric), 4.2 (60 metric), and 5.6 (80 metric)
- Flush, recessed, and concealed installations

See the Design and Installation Information table in this Bulletin for information on the approvals and availability of specific Model F1FR series sprinkler configurations.

Model F1FR Recessed Pendent and Recessed Horizontal Sidewall sprinklers are required to be used with Reliable Model F1, F2, or FP recessed escutcheons. See the Recessed Escutcheon Data table in this Bulletin for listing and approval information with each specific Model F1FR series sprinkler. Model F1 and F2 recessed escutcheons, shown in Fig. 1 and 3, are a friction fit assembly allowing for 3/4-inch (19mm) and 1/2-inch (12.7mm) of adjustment, respectively. Model FP recessed escutcheons, shown in Fig. 2, provide a 1/2-inch (12.7mm) threaded adjustment.

Model F1FR56 Concealed Pendent and Model F1FR56LL Concealed Pendent sprinklers are required to be used with Model CCP cover plates. A standard profile Model CCP cover plate is available that provides up to 1/2-inch (12.7mm) of cover plate adjustment. In addition, a low profile Model CCP cover plate is also available that provides up to 5/16-inch (8.0mm) of cover plate adjustment. See the Design and Installation Information and Listed and Approved Temperature Ratings tables in this Bulletin for further information on approved cover plate options.

## Application

Model F1FR Series sprinklers are intended for use in accordance with NFPA 13, FM Property Loss Prevention Data Sheets, and the requirements of the Authority Having Jurisdiction. Care must be exercised that the k-factor, temperature rating, deflector style, and sprinkler type are in accordance with the requirements of the applicable design and installation standards. In addition, Model F1FR Series sprinklers must be used in accordance with their listings and approvals, as well as the information provided in this Bulletin.

## Installation

Glass bulb sprinklers have orange bulb protectors or protective caps to minimize bulb damage during shipping, handling and installation. Reliable sprinkler installation wrenches are designed to install sprinklers with bulb protectors in place. Remove the bulb protector at the time when the sprinkler system is placed in service for fire protection. Removal of the bulb protector before this time may leave the bulb vulnerable to damage. Remove bulb protectors by undoing the clasp by hand. Do not use tools to remove bulb protectors.

Model F1FR Series sprinklers must be installed with the Reliable sprinkler installation wrench identified in the Design and Installation Information table in this Bulletin. Any other wrench may damage the sprinkler. A leak tight sprinkler joint can be obtained with a torque of 8 to 18 lb-ft (11 to 24 N-m). Do not tighten sprinklers over the maximum recommended installation torque. Exceeding the maximum recommended installation torque may cause leakage or impairment of the sprinkler.

## Recessed Sprinklers

Model F1FR Series Recessed sprinklers are to be installed as shown in Fig. 1, Fig. 2, or Fig. 3, as applicable to the specific model being installed. The Recessed Escutcheon Data table in the Bulletin identifies the only recessed escutcheons that are permitted to be used with each Model F1FR Series Recessed sprinkler. The use of any other recessed escutcheon will void all approvals and negate all warranties.

## Concealed Sprinklers

Model F1FR Series Concealed Pendent sprinklers are to be installed as shown in Fig. 4 or Fig. 5, as applicable to the selected cover plate. Model F1FR56 Concealed Pendent and Model F1FR56LL Concealed Pendent sprinklers have a factory-installed Model CCP cup. A protective cap is installed at the factory that should remain on the sprinkler until the sprinkler is installed and should then be reinstalled on the sprinkler until the cover plate is installed. The concealed sprinkler assemblies are completed by the installation of a Model CCP push-on/thread-off cover plate assembly. The cover plate and sprinkler cup assemblies are joined using a cover plate skirt with flexible tabs for threaded engagement. A choice of two Model CCP cover plate assemblies provides either 1/2-inch (13mm) or 5/8-inch (8mm) of cover adjustment. Do not install Model F1FR Series Concealed Pendent sprinklers in ceilings which have positive pressure in the space above.

Model F1FR Series Concealed Pendent sprinklers require a 2-5/8-inch (67mm) diameter hole to be cut in the ceiling. The Model GFR2 wrench is used to engage the sprinkler wrenching surfaces and to install the sprinkler in the fitting. Remove the protective cap to install the sprinkler, then reinstall the protective cap until the cover plate is installed. When inserting or removing the wrench from the sprinkler/cup assembly, care should be taken to prevent damage to the sprinkler. Do not wrench any other part of the sprinkler/cup assembly. Installation is completed by removing the protective cap from the sprinkler and pushing the cover plate onto the cup. Final adjustment is made by hand turning the cover plate until the skirt flange makes full contact with the ceiling. Cover plate removal requires turning the cover plate in the counter clockwise direction. After installation, inspect all sprinklers to ensure that there is a gap between the cover plate and ceiling and that the four cup slots are open and free from any air flow impediment to the space above.

Concealed cover plate/cup assemblies are listed only for use with specific sprinklers. The use of any concealed cover plate/cup assembly other than the Reliable Model CCP with Model F1FR56 Concealed Pendent and Model F1FR56LL Concealed Pendent sprinklers or the use of the Model CCP Concealed cover plate assembly on any sprinkler with which it is not specifically listed may prevent good fire protection and will void all guarantees, warranties, listings and approvals.



## Technical Data:

**Sensitivity:** Quick-response

**Thread Size:** 1/2-inch NPT standard; ISO 7-R1/2 optional

**Maximum Working Pressure:** 175 psi (12 bar) - 100% Factory tested hydrostatically to 500 psi (34.5 bar)

SIN RA1425, RA1414 & RA1435 cULus listed for 250 psi (17 bar)

Design and Installation Information											
Model	Nominal K-factor		Nominal Orifice Diameter		Deflector/ Orientation	Nominal Sprinkler Height		Installation Wrench	SIN	Listings and Approvals	Approval Notes
	US	Metric	inches	mm		inches	mm				
F1FR28	2.8	40	3/8	10	Pendent	2.25	57	W2	RA1411	cULus	2
					Recessed Pendent	2.25	57	GFR2	RA1411	cULus	2
					Upright	2.25	57	W2	RA1421	cULus	1,2
F1FR40	4.0	57	3/8	10	Pendent	2.25	57	W2	RA1418	VdS	
					Recessed Pendent	2.25	57	GFR2	RA1418	VdS	
F1FR42	4.2	60	7/16	10	Pendent	2.25	57	W2	RA1413	cULus	2
					Recessed Pendent	2.25	57	GFR2	RA1413	cULus	2
					Upright	2.25	57	W2	RA1423	cULus	1,2
F1FR42LL	4.2	60	7/16	10	Pendent	2.25	57	W2	RA1410	cULus, ULH	
					Recessed Pendent	2.25	57	GFR2	RA1410	cULus, ULH	
F1FRXLH (F1FR42 with Pintle)	4.2	60	7/16	10	Pendent	2.25	57	W2	RA1413	cULus	2
					Recessed Pendent	2.25	57	GFR2	RA1413	cULus	2
					Upright	2.25	57	W2	RA1423	cULus	1,2
F1FR56	5.6	80	1/2	15	Pendent	2.25	57	W2	RA1414	cULus, FM, LPCB, VdS, EC	1,2,3,4
					Recessed Pendent	2.25	57	GFR2	RA1414	cULus, FM, LPCB, VdS, EC	1,2,3,4
					Concealed Pendent	2.25	57	GFR2	RA1414	cULus, VdS, EC	5,6
					Upright	2.25	57	W2	RA1425	cULus, FM, LPCB, VdS, EC	1,2,3,4
					"Conventional (Pendent or Upright)"	2.25	57	W2	RA1475	LPCB, VdS, EC	4
F1FR56LL	5.6	80	1/2	15	Pendent	2.25	57	W2	RA1415	cULus, ULH	1
					Recessed Pendent	2.25	57	GFR2	RA1415	cULus, ULH	
					Concealed Pendent	2.25	57	GFR2	RA1415	cULus, ULH	6
F1FR56	5.6	80	1/2	15	Horizontal Sidewall	2.63	67	W2	RA1435	cULus, FM	1,2,3,7
					Recessed Horizontal Sidewall	2.63	67	GFR2	RA1435	cULus, FM	8
F1FR56	5.6	80	1/2	15	Vertical Sidewall (Pendent or Upright)	2.25	57	W2	RA1485	cULus, FM, LPCB	1,2,3,9

(1) cULus Listed Corrosion Resistant sprinkler when ordered with available Polyester coating.

(2) cULus Listed Corrosion Resistant sprinkler when ordered with available Electroless Nickel PTFE plating.

(3) Available with FM approved Polyester coating in black or white.

(4) Available with LPCB and VdS approved Polyester coating.

(5) VdS and EC approvals of the F1FR56 Concealed Pendent sprinkler are for 155°F (68°C) temperature rated sprinklers only. VdS approved sprinklers must use Norbulb brand glass bulbs with the 1/2-inch (12.7mm) adjustment Model CCP cover plate only.

(6) Model F1FR56 Concealed Pendent and Model F1FR56LL Concealed Pendent sprinklers must be used with Reliable Model CCP cover plates, available as either standard depth with 1/2-inch (12.7mm) of adjustment or low profile with 5/16-inch (8.0 mm) of adjustment.

(7) cULus Listing of the F1FR56 Horizontal Sidewall sprinkler is for Light and Ordinary Hazard occupancies only. Minimum to maximum deflector to ceiling distance shall be 4 inches to 12 inches (102mm to 305mm). FM Approval of the F1FR56 Horizontal Sidewall sprinkler is for Light Hazard occupancies only.

(8) cULus Listing and FM Approval of the F1FR56 Recessed Horizontal Sidewall sprinkler is for Light Hazard occupancies only.

(9) The F1FR56 Vertical Sidewall sprinkler is listed and approved for use only in Light Hazard occupancies. LPCB approval of the F1FR56 Vertical Sidewall sprinkler is for installation in the Pendent position only.

## Listed and Approved Temperature Ratings

Model	Deflector/ Orientation	Ordinary Temp. Classification 100°F (38°C) Max. Ambient Temp.		Intermediate Temp. Classification 150°F (65°C) Max. Ambient Temp.		High Temp. Classification 225°F (107°C) Max. Ambient Temp.
		135°F (57°C) Temp. Rating Orange Bulb	155°F (68°C) Temp. Rating Red Bulb	175°F (79°C) Temp. Rating Yellow Bulb	200°F (93°C) Temp. Rating Green Bulb	286°F (141°C) Temp. Rating Blue Bulb
F1FR28	Pendent	cULus				
	Recessed Pendent	cULus				
	Upright	cULus				
F1FR40	Pendent	VdS				
	Recessed Pendent	VdS				
F1FR42	Pendent	cULus				
	Recessed Pendent	cULus				
	Upright	cULus				
F1FR42LL	Pendent				cULus, ULH	
	Recessed Pendent				cULus, ULH	
F1FRXLH	Pendent	cULus				
	Recessed Pendent	cULus				
	Upright	cULus				
F1FR56	Pendent	cULus, FM, LPCB, VdS, EC				
	Recessed Pendent	cULus, FM, LPCB, VdS, EC				
	Concealed Pendent*	cULus	cULus,VdS,EC	cULus		
	Upright	cULus, FM, LPCB, VdS, EC				
	“Conventional (Pendent or Upright)”	LPCB, VdS, EC				
F1FR56LL	Pendent				cULus, ULH	
	Recessed Pendent				cULus, ULH	
	Concealed Pendent*				cULus, ULH	
F1FR56	Horizontal Sidewall	cULus, FM				
	Recessed Horizontal Sidewall	cULus, FM				
F1FR56	Vertical Sidewall (Pen- dent or Upright)	cULus, FM, LPCB				

\* Model F1FR56 Concealed Pendent and F1FR56LL Concealed Pendent sprinklers must be used with Reliable Model CCP cover plates. For Ordinary Temperature Classification sprinklers use a 135°F (57°C) temperature rated cover plate. For Intermediate Temperature Classification sprinklers use a 165°F (74°C) temperature rated cover plate.

## Recessed Escutcheon Data

Model	Deflector/ Orientation	Listed and Approved Recessed Escutcheons			SIN
		Model F1 (Fig. 1 & 3) 3/4-inch (19mm) adjustment	Model F2 (Fig. 1 & 3) 1/2-inch (12.7mm) adjustment	Model FP (Fig. 2) 1/2-inch (12.7mm) adjustment	
F1FR28	Recessed Pendent	cULus	cULus	cULus	RA1411
F1FR40	Recessed Pendent	VdS	VdS	VdS	RA1418
F1FR42	Recessed Pendent	cULus	cULus	cULus	RA1413
F1FR42LL	Recessed Pendent	cULus, ULH	cULus, ULH	cULus, ULH	RA1410
F1FR42XLH	Recessed Pendent	cULus	cULus	cULus	RA1413
F1FR56	Recessed Pendent	cULus, LPCB, VdS, EC	cULus, FM, LPCB, VdS, EC	cULus, VdS, EC	RA1414
F1FR56LL	Recessed Pendent	cULus, ULH	cULus, ULH	cULus, ULH	RA1415
F1FR56	Recessed Horizontal Sidewall	cULus	cULus, FM	cULus	RA1435

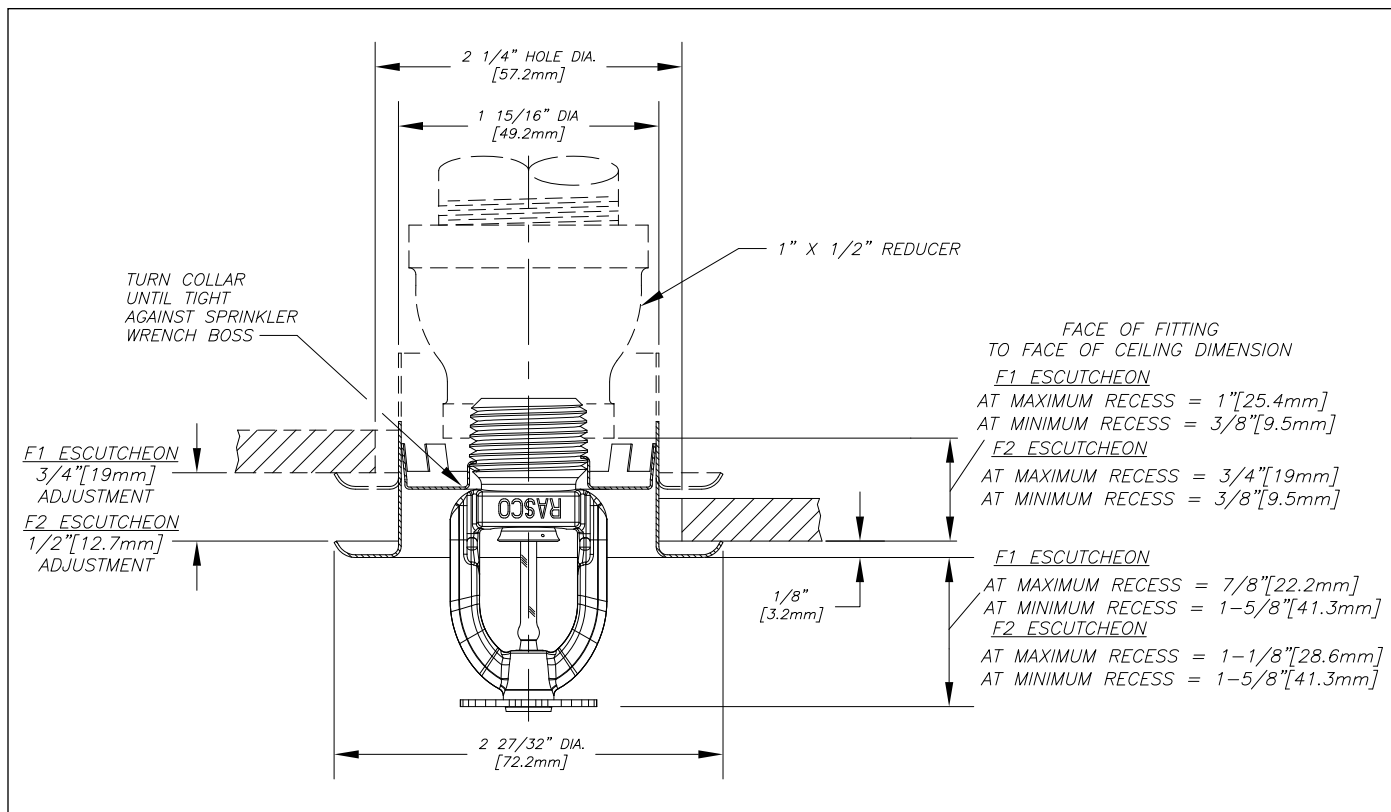


Fig. 1

Model F1FR56, F1FR56LL, F1FR42, F1FR40, F1FR42LL, F1FRXLH & F1FR28  
Recessed Pendent sprinkler with Model F1 or F2 escutcheon

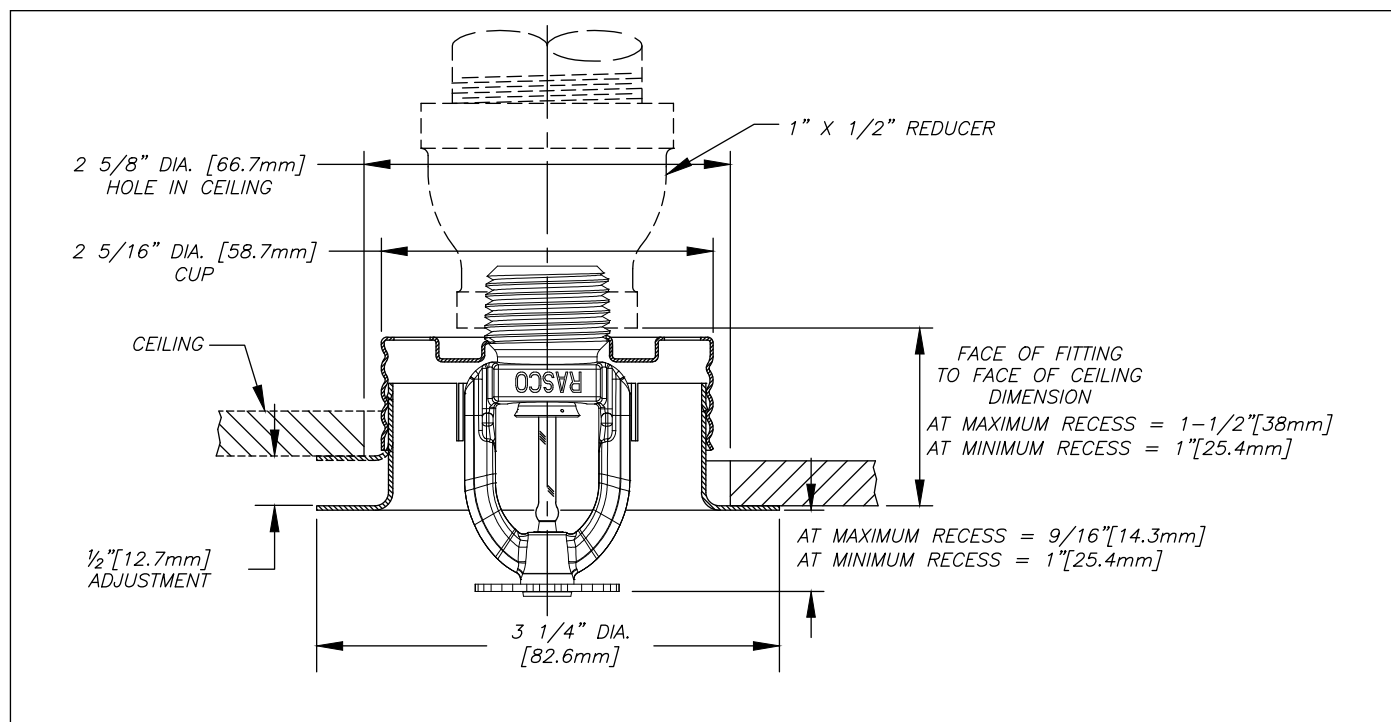


Fig. 2

Model F1FR56, F1FR56LL, F1FR42, F1FR40, F1FR42LL, F1FRXLH & F1FR28  
Recessed Pendent sprinkler with Model FP escutcheon

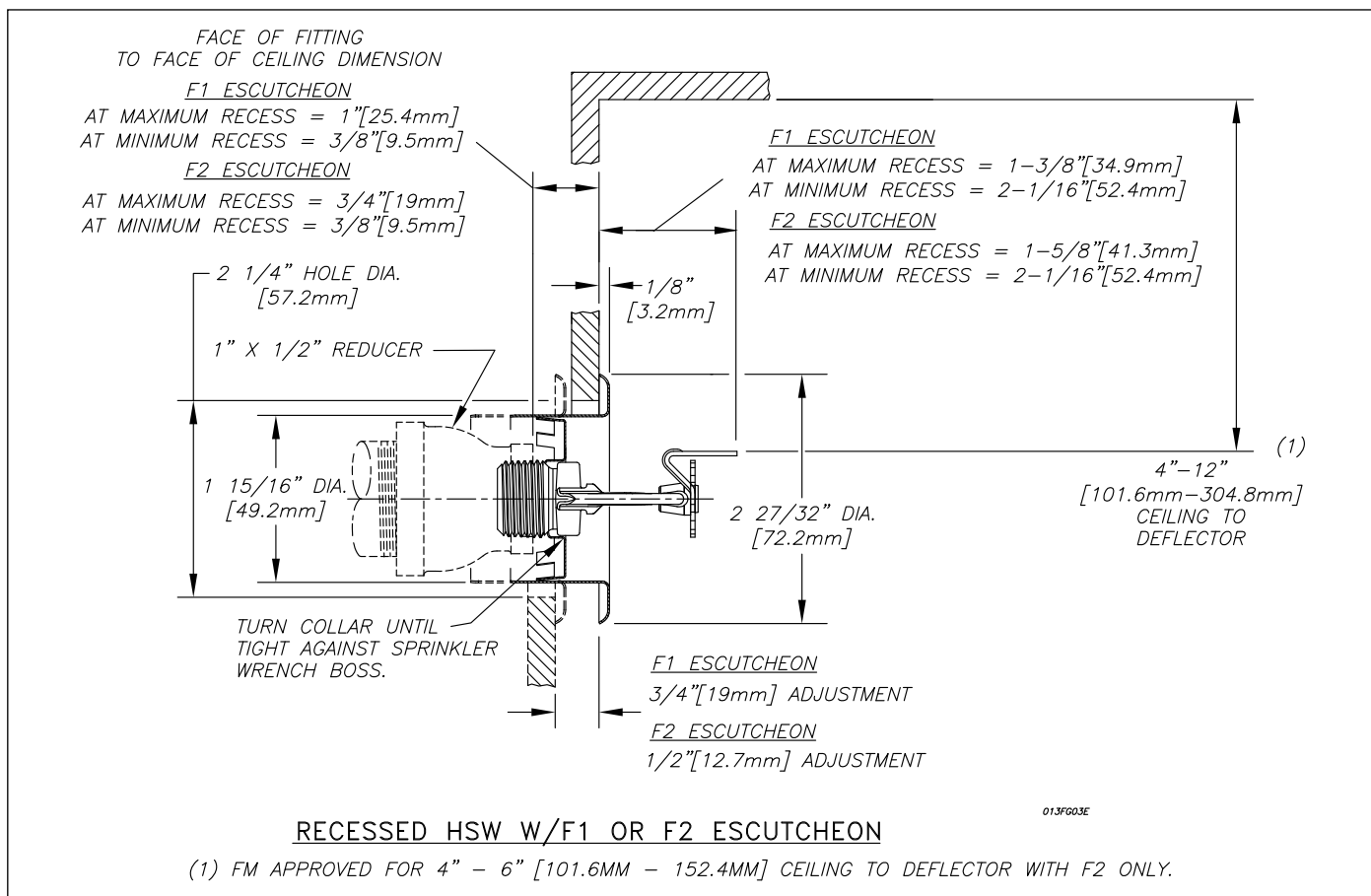


Fig. 3

Model F1FR56 Recessed Horizontal Sidewall sprinkler with Model F1 or F2 escutcheon

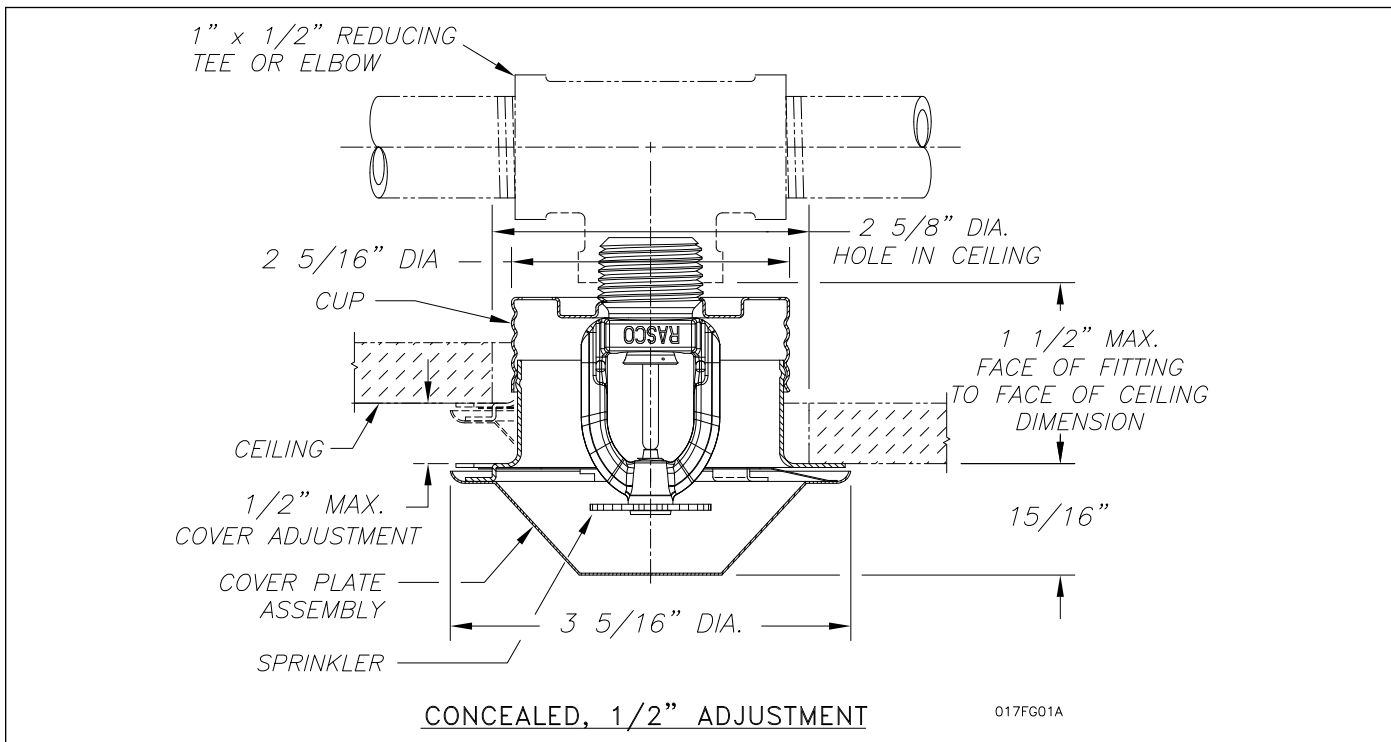


Fig. 4

Model F1FR56/F1FR56LL Concealed Pendent sprinkler with standard depth  
1/2-inch (12.7mm) adjustment - Model CCP cover plate



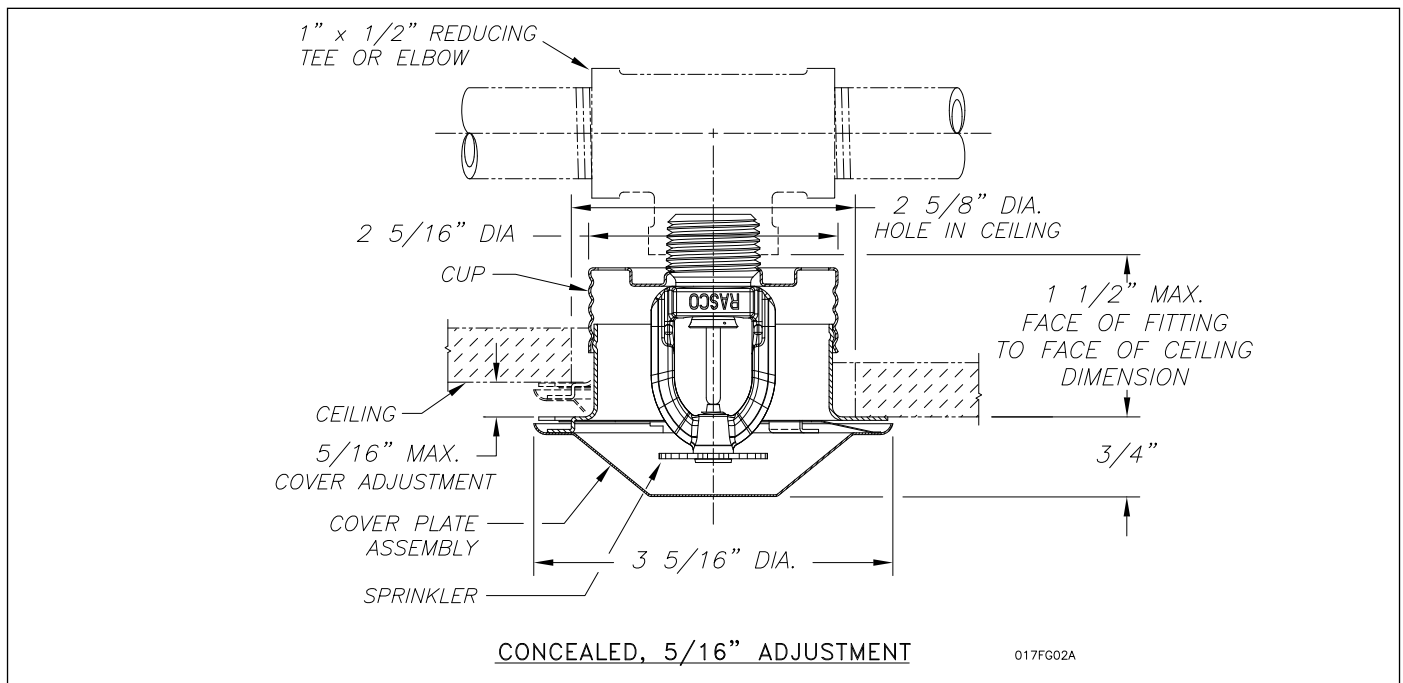


Fig. 5 - Model F1FR56/F1FR56LL Concealed Pendent sprinkler with low profile 5/16-inch (8.0mm) adjustment - Model CCP cover plate

## Maintenance

The Model F1FR Series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Remove dust by using a soft brush or gentle vacuuming. Replace any sprinkler which has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers.

## Finishes <sup>(1)</sup>

Standard Finishes		
Sprinkler	Escutcheon	Cover plate <sup>(1)</sup>
Bronze	Brass	Chrome
Chrome Plated	Chrome Plated	White
Polyester Coated <sup>(4)(5)(6)</sup>	White Painted	
Special Application Finishes		
Sprinkler	Escutcheon	Cover plate <sup>(1)</sup>
Electroless Nickel PTFE <sup>(7)</sup>	Electroless Nickel PTFE	Bright Brass
Bright Brass <sup>(3)</sup>	Bright Brass	Black Plating
Black Plated	Black Plated	Black Paint
Black Paint <sup>(2)(6)</sup>	Black Paint	Off White
Off White <sup>(2)(6)</sup>	Off White	Satin Chrome
Chrome Dull	Chrome Dull	

<sup>(1)</sup> Other finishes and colors are available on special order. Consult the factory for details. Custom color painted sprinklers may not retain their UL Corrosion resistance listing. Coverplate custom paint is semi-gloss, unless specified otherwise.

<sup>(2)</sup> cULus Listed only.

<sup>(3)</sup> 200°F (93°C) maximum.

<sup>(4)</sup> cULus listed "corrosion resistance" applies to SIN Numbers RA1435 (HSW), RA1485(VSW), RA1425 (Upright), RA1414 (Pendent) and RA1415 (Pendent) in standard black or white. Corrosion resistance in other polyester colors is available upon request.

<sup>(5)</sup> FM Approvals finish as "Polyester coated" applies to SIN Number RA1414, RA1435 and RA1425 in standard black or white.

<sup>(6)</sup> LPCB and VdS Approved finish applies only to RA1425, RA1414, RA1418 (VdS) and RA1475.

<sup>(7)</sup> cULus listed Corrosion Resistant

Material Data	
<b>Frame:</b>	DZR Brass, QM Brass, or Low Lead Brass
<b>Deflector:</b>	CDA Alloy 220, 260, or 510
<b>Load Screw/Pintle:</b>	CDA Alloy 360 or 544
<b>Cup:</b>	CDA Alloy 651 or 693
<b>Washer:</b>	Nickel Alloy 440 or 360, coated with PTFE Adhesive Tape
<b>Bulb:</b>	Glass

## Ordering Information

### Specify:

- Sprinkler Model: [F1FR28][F1FR40][F1FR42][F1FR42LL][F1FRXLH][F1FR56][F1FR56LL]
- Sprinkler Deflector/Orientation: [Pendent][Recessed Pendent][Upright][Conventional][Horizontal Sidewall][Recessed Horizontal Sidewall][Vertical Sidewall]
- Sprinkler threads: [1/2-inch NPT][ISO 7-R1/2]
- Sprinkler Temperature Rating: [135°F (57°C)][155°F (68°C)][175°F (79°C)][200°F (93°C)][286°F (141°C)]
- Sprinkler Finish
- Escutcheon Model: [F1][F2][FP]
- Escutcheon Finish (where applicable)
- Cover plate Model: [standard profile CCP 1/2-inch (12.7mm) adjustment][low profile CCP 5/16-inch (8.0mm) adjustment]
- Cover plate Temperature Rating: [135°F (57°C) for use with Ordinary Temperature sprinklers][165°F (74°C) for use with Intermediate Temperature sprinklers]
- Cover plate Finish

**Note:** When Model F1FR Series Recessed sprinklers are ordered, the sprinklers and escutcheons are packaged separately.

# Reliable...For Complete Protection

Reliable offers a wide selection of sprinkler components. Following are some of the many precision-made Reliable products that guard life and property from fire around the clock.

- Automatic sprinklers
- Flush automatic sprinklers
- Recessed automatic sprinklers
- Concealed automatic sprinklers
- Adjustable automatic sprinklers
- Dry automatic sprinklers
- Intermediate level sprinklers
- Open sprinklers
- Spray nozzles
- Alarm valves
- Retarding chambers
- Dry pipe valves
- Accelerators for dry pipe valves
- Mechanical sprinkler alarms
- Electrical sprinkler alarm switches
- Water flow detectors
- Deluge valves
- Detector check valves
- Check valves
- Electrical system
- Sprinkler emergency cabinets
- Sprinkler wrenches
- Sprinkler escutcheons and guards
- Inspectors test connections
- Sight drains
- Ball drips and drum drips
- Control valve seals
- Air maintenance devices
- Air compressors
- Pressure gauges
- Identification signs
- Fire department connection

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable. Products manufactured and distributed by Reliable have been protecting life and property for almost 100 years.

Manufactured by



**Reliable Automatic Sprinkler Co., Inc.**

(800) 431-1588  
(800) 848-6051  
(914) 829-2042  
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**Permit Number: 19-04603**



THIS INFORMATION PROVIDED IS BASED ON ASTM GUIDELINES FOR WELDED PIPE SPECIFICATIONS AND ASTM REQUIREMENTS. ACTUAL PIPE AND MATERIAL TEST REPORTS PROVIDED WOULD MEET OR EXCEED THESE GUIDELINES.

TEST REPORTS WOULD PROVIDE SPECIFIC AND ACTUAL DETAILS CONCERNING THE MECHANICAL AND CHEMICAL PROPERTIES OF THE ACTUAL PIPE, AS WELL AS ADDITIONAL TESTS RESULTS REQUIRED BY ASTM.

### SCHEDULE 10 \*\* Black and Galvanized Steel ERW Pipe

Pipe Size Nominal	O.D.	I.D.	Weight / Foot	Test Pressure psi
1"	1.315	1.097	1.410	700
1-1/4"	1.660	1.442	1.810	1200
1-1/2"	1.900	1.682	2.090	1200
2"	2.375	2.157	2.640	2300
2-1/2"	2.875	2.635	3.530	2500
3"	3.500	3.260	4.340	1290
4"	4.500	4.260	5.620	1000
5"	5.563	5.295	7.780	1010
6"	6.625	6.357	9.300	1020
8" **	8.625	8.249	16.960	780

\*\* 8" wall thickness is 0.188, not SCH10 or 0.148" wall thickness.

### COMPOSITION AND PROPERTIES

Chemical and mechanical properties requirements are as prescribed by applicable ASTM standards edition January 2006.

#### Chemical Requirements, Percent (Product)

Specification	Grade	C	Mn	P	S	Other
		max	max	max	max	
ASTM A53	A	0.250	0.950	0.05	0.045	-

1 Residual elements max: Cu-0.40, Ni-0.40, Cr-0.40, Mo-0.15 and V-.08. These live elements combined shall not exceed 1%.

#### Mechanical Properties-Tensile Requirements

Specification	Grade	Strength-psi.			
		Yield		Tensile	
		Min	Max	Min	Max
ASTM A53	A	30,000	-	48,000	-

NOTE: Elongation requirements vary with nominal area of test specimen and specified minimum tensile strength of the steel grade.



THIS INFORMATION PROVIDED IS BASED ON ASTM GUIDELINES FOR WELDED PIPE SPECIFICATIONS AND ASTM REQUIREMENTS. ACTUAL PIPE AND MATERIAL TEST REPORTS PROVIDED WOULD MEET OR EXCEED THESE GUIDELINES.

TEST REPORTS WOULD PROVIDE SPECIFIC AND ACTUAL DETAILS CONCERNING THE MECHANICAL AND CHEMICAL PROPERTIES OF THE ACTUAL PIPE, AS WELL AS ADDITIONAL TESTS RESULTS REQUIRED BY ASTM.

#### SCHEDULE 40 Black and Galvanized Steel ERW Pipe

Pipe Size Nominal	O.D.	I.D.	Weight / Foot	Test Pressure psi
1"	1.315	1.049	1.680	700
1-1/4"	1.660	1.380	2.270	1200
1-1/2"	1.900	1.610	2.720	1200
2"	2.375	2.067	3.660	2300
2-1/2"	2.875	2.469	5.800	2500
3"	3.500	3.068	7.580	2220
4"	4.500	4.026	10.800	1900
5"	5.563	5.047	14.630	1670
6"	6.625	6.065	18.990	1520
8"	8.625	7.981	28.580	1340

#### COMPOSITION AND PROPERTIES

Chemical and mechanical properties requirements are as prescribed by applicable ASTM standards edition January 2006.

##### Chemical Requirements, Percent (Product)

		C	Mn	P	S	Other
Specification	Grade	max	max	max	max	
ASTM A53	A	0.250	0.950	0.05	0.045	-

1 Residual elements max: Cu-0.40, Ni-0.40, Cr-0.40, Mo-0.15 and V-.08. These live elements combined shall not exceed 1%.

##### Mechanical Properties-Tensile Requirements

		Strength-psi.			
		Yield		Tensile	
Specification	Grade	Min	Max	Min	Max
ASTM A53	A	30,000	-	48,000	-

NOTE: Elongation requirements vary with nominal area of test specimen and specified minimum tensile strength of the steel grade.



# FireLock EZ® Rigid Coupling

## Style 009N



PATENTED

### Approvals/Listings:



[See Victaulic Publication 10.01 for more details.](#)

### Product Description:

The FireLock EZ Style 009N Installation-Ready™ Rigid Coupling is for use in the fire protection market. The coupling's unique design eliminates loose parts, promotes consistent installation and provides substantial gains in productivity.

#### IMPORTANT

FireLock EZ Style 009N couplings are recommended for use ONLY on fire protection systems.

### Material Specifications:

#### 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.

#### Housing Coating:

Orange enamel (North America, Asia Pacific)

Red enamel (Europe)

Optional: Hot dipped galvanized

#### Gasket:

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.

#### Bolts/Nuts:

Zinc electroplated carbon steel, trackhead meeting the physical and chemical requirements of ASTM A-449 and physical requirements of ASTM A-183.

#### Job/Owner

System No.	
Location	

#### Contractor

Submitted By	
Date	

#### Engineer

Spec Section	
Paragraph	
Approved	
Date	

## Listings/Approvals <sup>1</sup>

The information provided below is based on the latest listing and approval data at the time of publication. Listings/Approvals are subject to change and/or additions by the approvals agencies. Contact Victaulic for performance on other pipe and the latest listings and approvals.

Nominal Size inches mm	cULus			FM			Vds	LPCB
	Sch. 5 psi kPa	Sch. 10 psi kPa	Sch. 40 psi kPa	Sch. 5 psi kPa	Sch. 10 psi kPa	Sch. 40 psi kPa	psi kPa	psi kPa
1 ¼ 32	232 1600	365 2517	365 2517	175 1205	363 2502	363 2502	365 2517	365 2517
1 ½ 40	232 1600	365 2517	365 2517	175 1205	363 2502	363 2502	365 2517	365 2517
2 50	363 2502	365 2517	365 2517	175 1205	363 2502	363 2502	365 2517	365 2517
2 ½ 65	N/A	365 2517	365 2517	175 1205	363 2502	363 2502	365 2517	365 2517
76.1 mm	N/A	365 <sup>2</sup> 2517	N/A	N/A	363 <sup>3</sup> 2502	N/A	365 2517	365 2517
3 80	N/A	365 2517	365 2517	175 1205	363 2502	363 2502	365 2517	365 2517
4 100	N/A	365 2517	365 2517	175 1205	363 2502	363 2502	365 2517	365 2517
108.0mm	N/A	N/A	N/A	N/A	363 2502	363 2502	N/A	N/A
5 125	N/A	290 2000	365 2517	N/A	363 2502	363 2502	N/A	N/A
133.0mm	Refer to Submittal 10.61							
139.7mm	Refer to Submittal 10.61							
165.1 mm	Refer to Submittal 10.61							
6 150	N/A	290 2000	365 2517	N/A	363 2502	363 2502	N/A	N/A
8 200	N/A	290 2000	365 2517	N/A	363 2502	363 2502	N/A	N/A

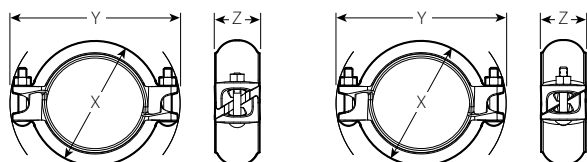
1 Listed/Approved for wet and dry pipe systems (> -40°F/-40°C) for continuous use in freezing conditions, use of silicone gaskets is recommended. Please refer to the Victaulic Installation Manual (I-009N/009H) for details concerning when supplemental lubrication is required.

2 cULus listed for DIN 2458 2.6 mm pipe wall.

3 FM approved for BS 1387 Medium 3.6 mm pipe wall.

## Speciality Pipe

Pipe Sch.	Size inches	Pressure Rating		Pipe Sch.	Size inches	Pressure Rating		Pipe Sch.	Size inches	Pressure Rating	
		cULus psi kPa	FM psi kPa			cULus psi kPa	FM psi kPa			cULus psi kPa	FM psi kPa
BLT	1 ¼ – 2	300 2068	365 2517	EZT	1 ¼ – 2	300 2068	365 2517	MT	1 ¼ – 2	300 2068	365 2517
DF	1 ¼ – 4	300 2068	365 2517	FF	1 ¼ – 4	300 2068	365 2517	MLT	1 ¼ – 2	N/A	365 2517
DT	1 ¼ – 2	300 2068	365 2517	FLF	1 ¼ – 4	N/A	365 2517	ST	1 ¼ – 2	N/A	365 2517
EF	1 ¼ – 4	175 1206	175 1206	FLT	1 ¼ – 2	N/A	365 2517	STF	1 ¼ – 4	N/A	365 2517
EL	1 ¼ – 2	300 2068	365 2517	FLTL	1 ¼ – 2	N/A	365 2517	TF	2 ¼ – 4	N/A	365 2517
ET40	1 ¼ – 2	300 2068	365 2517	GL	1 ¼ – 2	300 2068	365 2517	WLS	1 ¼ – 2	300 2068	365 2517
EZF	3 – 4	300 2068	365 2517	MF	1 ¼ – 4	300 2068	365 2517	WST	1 ¼ – 2	N/A	365 2517
								XL	1 ¼ – 2	300 2068	365 2517

**Style 009N Dimensions:**Style 009N Pre-Assembled  
(Push On Condition)

Style 009N Joint Assembled

Nominal Size inches mm	Actual Outside Diameter inches mm	Maximum Working Pressure <sup>1</sup> psi kPa	Maximum End Load <sup>1</sup> lbs. N	Allow. Pipe End Separation <sup>2</sup> inches mm	Bolt/Nut <sup>3</sup> (No.) size inches	Dimensions					Approx. Weight Each lbs. kg
						Pre-assembled (Push On Condition)		Joint Assembled			
						X inches mm	Y inches mm	X inches mm	Y inches mm	Z inches mm	
1 ¼ 32	1.660 42.4	365 2517	790 3514	0.10 2.54	2 – ¾ × 2 M – 10 x 2	3.10 79	4.90 124	2.70 69	4.90 124	1.92 49	1.4 0.7
1 ½ 40	1.900 48.3	365 2517	1035 4604	0.10 2.54	2 – ¾ × 2 M – 10 x 2	3.30 84	5.10 129	3.00 76	5.10 129	1.92 49	1.5 0.7
2 50	2.375 60.3	365 2517	1616 7193	0.12 3.05	2 – ¾ × 2 M – 10 x 2	3.90 99	5.60 142	3.50 89	5.60 142	1.95 50	1.9 0.9
2 ½ 65	2.875 73.0	365 2517	2370 10542	0.12 3.05	2 – ¾ × 2 ½ M – 10 x 2 ½	4.50 114	6.10 155	4.00 102	6.10 155	1.95 50	2.1 1.0
76.1 mm	3.000 76.1	365 2517	2580 11476	0.12 3.05	2 – ¾ × 2 ½ M – 10 x 2 ½	4.56 115.7	6.00 152.5	4.05 102.8	6.06 153.9	1.94 49.2	2.1 1.0
	3 80	3.500 88.9	365 2517	3512 15622	0.12 3.05	2 – ¾ × 2 ½ M – 10 x 2 ½	5.10 129	6.70 170	4.60 117	6.70 170	1.95 50
4 100	4.500 114.3	365 2517	5805 25822	0.17 4.32	2 – ¾ × 2 ½ M – 10 x 2 ½	5.95 151	7.80 199	5.54 141	7.47 190	2.14 55	2.9 1.3
	108.0 mm	4.250 108.0	365 2517	5175 23020	0.17 4.318	2 – ¾ × 2 ½	5.56 141	7.39 1.88	5.28 134	7.36 187	2.14 54
5 125	5.563 141.3	365 2000	5178 23033	0.17 4.318	2 – ½ × 3	7.19 183	9.25 235	6.7 170	9.11 231	2.19 56	5.0 2.3
133.0 mm	Refer to Submittal 10.61										
139.7 mm	Refer to Submittal 10.61										
165.1 mm	Refer to Submittal 10.61										
6 150	6.625 168.3	365 2000	9997 44469	0.17 4.318	2 – ½ × 3 ¼	8.32 211	10.29 261	7.82 199	10.13 257	2.17 55	6.0 2.7
8 200	8.625 219.1	365 1620	13730 61074	0.17 4.318	2 – ¾ × 4	10.89 277	13.31 338	10.22 260	13.1 333	2.5 64	11.4 5.2

- Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. See page 1 of this document for Listed/Approved ratings on other pipe. WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1 ½ times the figures shown in the chart on page 1, specific to pipe schedule and size.
- The allowable pipe separation dimension shown is for system layout purposes only. FireLock EZ couplings are considered rigid connections and will not accommodate expansion or contraction of the piping system.
- Number of bolts required equals number of housing segments.

**General Notes:**

NOTE: When assembling FireLock EZ couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For FireLock EZ Style 009N couplings, use FireLock No. 006 end caps containing the "EZ" marking on the inside face or No. 60 end caps containing the "QV EZ" marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009N couplings. IMPORTANT: Gaskets intended for the Style 009 or Style 009V couplings cannot be used with the Style 009N coupling. There is no interchanging of gaskets or housings between coupling styles.

**Use Of Flushseal Gaskets For Dry Pipe Systems**

NOTE: FireLock EZ couplings are supplied with FireLock EZ Grade "E" Type A gaskets. These gaskets include an integral pipe stop, that once installed provides the similar benefits as a FlushSeal gasket for dry pipe systems. It should be noted that standard Victaulic FlushSeal gaskets are not compatible and cannot be used with the FireLock EZ couplings.

**Installation**

Reference should always be made to the [I-100 Victaulic Field Installation Handbook](#) for the product you are installing. Handbooks are included with each shipment of Victaulic products for complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

**Warranty**

Refer to the Warranty section of the current Price List or contact Victaulic for details.

**Note**

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

**Trademarks**

Victaulic, FireLock EZ, and Installation-Ready are registered trademarks of Victaulic Company.



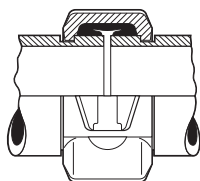


# Victaulic® Flexible Coupling

## Style 75



1 – 8"/DN25 – DN200



*Exaggerated for clarity*

### 1.0 PRODUCT DESCRIPTION

#### Available Sizes

- 1 – 8"/DN25 – DN200

#### Pipe Material

- Carbon steel
- Stainless steel

#### Maximum Working Pressure

- Accommodates pressures ranging from full vacuum (29.9 in Hg/760 mm Hg) up to 500 psi/3447 kPa/34 bar
- Working pressure dependent on material, wall thickness and size of pipe

#### Application

- Joins standard roll grooved and cut grooved pipe, as well as grooved fittings, valves and accessories
- Provides a flexible pipe joint which allows for expansion, contraction and deflection
- Up to 50% lighter in weight than standard Victaulic Style 77 or Style 177N flexible couplings

### 2.0 CERTIFICATION/LISTINGS



#### NOTES

- Download [publication 10.01](#) for Fire Protection Certifications/Listings Reference Guide.
- See [publication 02.06](#): Victaulic Potable Water Approvals ANSI/NSF for potable water approvals if applicable.

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	

### 3.0 SPECIFICATIONS – MATERIAL

**Housing:** Ductile iron conforming to ASTM A536, Grade 65-45-12. Ductile iron conforming to ASTM A395, Grade 65-45-15, is available upon special request.

**Housing Coating: (specify choice)**

Standard: Orange enamel

Optional: Hot dipped galvanized

Optional: Contact Victaulic with your requirements for other coatings.

**Gasket: (specify choice<sup>1</sup>)**

**Grade “E” EPDM**

EPDM (Green stripe color code). Temperature range –30°F to +230°F/–34°C to +110°C. May be specified for hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL Classified in accordance with ANSI/NSF 61 for cold +73°F/+23°C and hot +180°F/+82°C potable water service and ANSI/NSF 372. **NOT COMPATIBLE FOR USE WITH PETROLEUM SERVICES OR STEAM SERVICES.**

**Grade “T” Nitrile**

Nitrile (Orange stripe color code). Temperature range –20°F to +180°F/–29°C to +82°C. May be specified for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range; not compatible for hot dry air over +140°F/+60°C and water over +150°F/+66°C. **NOT COMPATIBLE FOR USE WITH HOT WATER.**

**Others**

For alternate gasket selection, reference [publication 05.01](#): Victaulic Seal Selection Guide - Elastomeric Seal Construction.

<sup>1</sup> 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 Seal Selection Guide](#) for specific gasket service guidelines and for a listing of services which are not compatible.

**Bolts/Nuts: (specify choice<sup>2</sup>)**

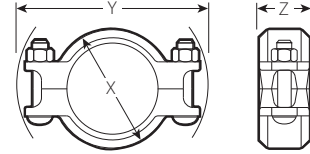
Standard: Carbon steel oval neck track bolts meeting the mechanical property requirements of ASTM A449 (imperial) and ISO 898-1 Class 9.8 (metric). Carbon steel hex nuts meeting the mechanical property requirements of ASTM A563 Grade B (imperial - heavy hex nuts) and ASTM A563M Class 9 (metric - hex nuts). Track bolts and hex nuts are zinc electroplated per ASTM B633 ZN/FE5, finish Type III (imperial) or Type II (metric).

Optional (imperial): Stainless steel oval neck track bolts meeting the mechanical property requirements of ASTM F593, Group 2 (316 stainless steel), condition CW. Stainless steel heavy nuts meeting the mechanical property requirements of ASTM F594, Group 2 (316 stainless steel), condition CW, with galling reducing coating.

<sup>2</sup> Optional bolts/nuts are available in imperial sizes only.

## 4.0 DIMENSIONS

### Style 75



Size		Pipe End Separation <sup>3</sup>	Deflection from Centerline <sup>3</sup>		Bolt/Nut		Dimensions			Weight
Nominal inches DN	Actual Outside Diameter inches mm	Allowable inches mm	Per Cplg. Degrees	Pipe inches/ft. mm/m	Qty.	Size imperial metric	X inches mm	Y inches mm	Z inches mm	Approx. (Each) lb kg
1 DN25	1.315 33.7	0-0.06 0-1.6	2°-43'	0.57 48	2	3/8 x 2 M10 x 51	2.38 61	4.27 108	1.77 45	1.3 0.6
1 1/4 DN32	1.660 42.4	0-0.06 0-1.6	2°-10'	0.45 38	2	3/8 x 2 M10 x 51	2.68 68	4.61 117	1.77 45	1.4 0.6
1 1/2 DN40	1.900 48.3	0-0.06 0-1.6	1°-56'	0.40 33	2	3/8 x 2 M10 x 51	2.91 74	4.82 122	1.77 45	1.5 0.6
2 DN50	2.375 60.3	0-0.06 0-1.6	1°-31'	0.32 26	2	3/8 x 2 M10 x 51	3.43 87	5.22 133	1.88 48	1.7 0.8
2 1/2	2.875 73.0	0-0.06 0-1.6	1°-15'	0.26 22	2	3/8 x 2 M10 x 51	3.88 98	5.68 144	1.88 48	1.9 0.9
DN65	3.000 76.1	0-0.06 0-1.6	1°-12'	0.26 22	2	3/8 x 2 M10 x 51	4.00 102	5.90 150	1.88 48	1.9 0.9
3 DN80	3.500 88.9	0-0.06 0-1.6	1°-2'	0.22 18	2	1/2 x 2 3/4 M12 x 70	4.50 114	7.00 178	1.88 48	2.9 1.3
3 1/2 DN90	4.000 101.6	0-0.06 0-1.6	0°-54'	0.19 16	2	1/2 x 2 3/4 M12 x 70	5.00 127	7.50 191	1.88 48	2.9 1.3
4 DN100	4.500 114.3	0-0.13 0-3.2	1°-36'	0.34 28	2	1/2 x 2 3/4 M12 x 70	5.80 147	8.03 204	2.13 54	4.1 1.9
	4.250 108.0	0-0.13 0-3.2	1°-41'	0.35 29	2	1/2 x 2 3/4 M12 x 70	5.55 141	7.79 198	2.13 54	3.7 1.7
	5.000 127.0	0-0.13 0-3.2	1°-26'	0.25 21	2	5/8 x 3 1/4 M16 x 83	6.13 156	9.43 240	2.13 54	5.5 2.5
5	5.563 141.3	0-0.13 0-3.2	1°-18'	0.27 23	2	5/8 x 3 1/4 M16 x 83	6.88 175	10.07 256	2.13 54	5.8 2.6
	5.250 133.0	0-0.13 0-3.2	1°-21'	0.28 24	2	5/8 x 3 1/4 M16 x 83	6.55 166	9.37 238	2.13 54	6.0 2.7
DN125	5.500 139.7	0-0.13 0-3.2	1°-18'	0.28 24	2	5/8 x 3 1/4 M16 x 83	6.80 173	9.59 244	2.13 54	6.3 2.9
	6.000 152.4	0-0.13 0-3.2	1°-12'	0.21 18	2	5/8 x 3 1/4 M16 x 83	7.38 187	10.48 266	1.88 48	6.2 2.8
6 DN150	6.625 168.3	0-0.13 0-3.2	1°-5'	0.23 18	2	5/8 x 3 1/4 M16 x 83	8.00 203	11.07 281	2.13 54	7.0 3.2
	6.250 159.0	0-0.13 0-3.2	1°-9'	0.24 20	2	5/8 x 3 1/4 M16 x 83	7.63 194	10.49 266	2.13 54	6.8 3.1
	6.500 165.1	0-0.13 0-3.2	1°-7'	0.23 58	2	5/8 x 3 1/4 M16 x 83	7.84 199	10.66 271	2.08 53	6.6 3.0
	8.515 216.3	0-0.13 0-3.2	0°-51'	0.18 46	2	3/4 x 4 1/4 M20 x 108	10.19 259	13.75 350	2.32 59	13.2 6.0
8 DN200	8.625 219.1	0-0.13 0-3.2	0°-50'	0.18 14	2	3/4 x 4 1/4 M20 x 108	10.34 263	13.97 355	2.13 59	12.4 5.6

<sup>3</sup> Allowable Pipe End Separation and Deflection figures show the maximum nominal range of movement available at each joint for standard **roll** grooved pipe. Figures for standard **cut** grooved pipe may be doubled. These figures are maximums; for design and installation purposes these figures should be reduced by: 50% for 3/4 - 3 1/2"/DN20 - DN90; 25% for 4"/DN100 and larger.

#### NOTE

- Metric thread size bolts are available (color coded gold) for all coupling sizes upon request. Contact Victaulic for details.

## 5.0 PERFORMANCE

### Style 75

Size		Maximum Working Pressure <sup>4</sup>	Maximum End Load <sup>4</sup>
Nominal inches DN	Actual Outside Diameter inches mm		
1 DN25	1.315 33.7	500 3447	680 3,025
1 ¼ DN32	1.660 42.4	500 3447	1080 4,805
1 ½ DN40	1.900 48.3	500 3447	1420 6,320
2 DN50	2.375 60.3	500 3447	2215 9,860
2 ½	2.875 73.0	500 3447	3245 14,440
DN65	3.000 76.1	500 3447	3535 15,730
3 DN80	3.500 88.9	500 3447	4800 21,360
3 ½ DN90	4.000 101.6	500 3447	6300 28,035
4 DN100	4.500 114.3	500 3447	7950 35,380
	4.250 108.0	450 3103	6380 28,395
	5.000 127.0	450 3103	8820 39,250
5	5.563 141.3	450 3103	10935 48,660
	5.250 133.0	450 3103	9735 43,325
DN125	5.500 139.7	450 3103	10665 47,460
	6.000 152.4	450 3103	12735 56,670
6 DN150	6.625 168.3	450 3103	15525 69,085
	6.250 159.0	450 3103	13800 61,405
	6.500 165.1	450 3103	14930 66,412
	8.515 216.3	450 3103	25625 113,986
8 DN200	8.625 219.1	450 3103	26280 116,945

<sup>4</sup> Working Pressure and End Load are total, from all internal and external loads, based on ANSI B36.10 sized carbon steel pipe, grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

#### NOTE

- WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1½ times the figures shown.

## 6.0 NOTIFICATIONS

### WARNING

- Victaulic RX roll sets must be used when grooving light-wall/thin-wall stainless steel pipe for use with Victaulic Couplings.

Failure to use Victaulic RX roll sets when grooving light-wall/thin-wall stainless steel pipe may cause joint failure, resulting in serious personal injury and/or property damage.

### NOTICE

- Victaulic RX grooving rolls must be ordered separately. They are identified by a silver color and the designation RX on the front of the roll sets.

## 7.0 REFERENCE MATERIALS

[02.06: Victaulic® Potable Water Approvals ANSI/NSF](#)

[05.01: Victaulic® Seal Selection Guide - Elastomeric Seal Construction](#)

[06.15: Victaulic® Pressure Ratings and End Loads for Victaulic Couplings on Steel Pipe](#)

[10.01: Victaulic® Products for Fire Protection Pipings Systems - Regulatory Approval Reference Guide](#)

[17.01: Victaulic® Pipe Preparation for Use on Stainless Steel Pipe With Victaulic Products](#)

[17.09: Victaulic® Ductile Iron Grooved Couplings Performance Data for Stainless Steel Pipe](#)

[25.01: Victaulic® Standard Groove Specifications](#)

[26.01: Victaulic® Design Data](#)

[29.01: Victaulic® Terms and Conditions of Sale](#)

[I-100: Victaulic® Field Installation Handbook](#)

### User Responsibility for Product Selection and Suitability

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

### Intellectual Property Rights

No statement contained herein concerning a possible or suggested use of any material, product, service, or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Victaulic or any of its subsidiaries or affiliates covering such use or design, or as a recommendation for the use of such material, product, service, or design in the infringement of any patent or other intellectual property right. The terms "Patented" or "Patent Pending" refer to design or utility patents or patent applications for articles and/or methods of use in the United States and/or other countries.

### Note

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

### Installation

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

### Warranty

Refer to the Warranty section of the current Price List or contact Victaulic for details.

### Trademarks

*Victaulic* and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.







No. 20 Tee

No. 10 Elbow

## 1.0 PRODUCT DESCRIPTION

### Available Sizes

- ¾ – 60"/DN20 – DN1500

### Maximum Working Pressure

- Pressure ratings for Victaulic standard fittings conform to the ratings of Victaulic Style 177N couplings (refer to [publication 06.24](#) for more information).

### Application

- Connects pipe, provides change in direction and adapts sizes or components
- Supplied with Victaulic OGS grooves
- Exclusively for use with Victaulic couplings, valves, accessories and pipe which feature ends formed with the Victaulic OGS groove profile

### Pipe Materials

- Carbon steel or stainless steel

### NOTE

- These fittings are not intended for use with Victaulic plain end couplings. Intended for use only in grooved piping systems. When connecting wafer or lug type butterfly valves directly to Victaulic fittings using Style 741 or Style 743 flange adapters, be sure to check disc clearance dimensions with I.D. dimension of fitting.

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)

### Other Fitting Styles



AGS - Advanced Groove System  
from 14 – 60"/DN350 – DN1500  
[Publication 20.05](#)



Ductile Iron for AWWA size pipe  
[Publication 23.05](#)



Stainless Steel  
[Publication 17.16](#)



XL fittings for abrasive services  
[Publication 07.07](#)



Galvanized  
[Publication 07.01](#) for Original Groove Fittings  
[Publication 20.05](#) for AGS Fittings



Aluminum  
[Publication 21.03](#)



Extra Heavy EndSeal "ES"  
[Publication 07.03](#)



Shouldered Ends  
[Publication 07.06](#)



Copper  
[Publication 22.04](#)



Plain End  
[Publication 14.04](#)

## 2.0 CERTIFICATION/LISTINGS



### NOTES

- When supplied as "hot dip galvanized" the following fittings are UL Classified in accordance with ANSI/NSF 61 and for use on cold +86°F/+30°C potable water service and ANSI/NSF 372: No. 10 90° Elbow, No. 11 45° Elbow, No. 12 22 ½° Elbow, No. 13 11 ¼° Elbow, No. 100 90° Long Radius Elbow, No. 110 45° Long Radius Elbow, No. 20 Tee, No. 25 Tee with Grooved Branch, No. 30 45° Lateral, No. 60 Cap, No. 50 Concentric Reducers, No. 51 Eccentric Reducers.
- The following Victaulic fittings are VdS approved: No.10 90° Elbow, No.11 45° Elbow, No.20 Tee and No.60 Cap.
- The following Victaulic fittings are LPCB approved: No.10 90° Elbow, No.11 45° Elbow, No.12 22 ½° Elbow, No.13 11 ¼° Elbow, No.30 45° Lateral, No.30-R Reducing Lateral, No.100 Long Radius Elbow, No.110 Long Radius Elbow, No.20 Tee, No.35 Cross, No.60 Cap, No.25 Reducing Tee, No.33 True Wye, No.50 Concentric Reducer, No.51 Eccentric Reducer and No.29M Tee with Threaded Branch.
- The following Victaulic fittings are FM approved: No.10 90° Elbow, No.11 45° Elbow, No.12 22 ½° Elbow, No.13 11 ¼° Elbow, No.30 45° Lateral, No.100 Long Radius Elbow, No.20 Tee, No.35 Cross, No.60 Cap, No.25 Reducing Tee and No.50 Concentric Reducer.

## 3.0 SPECIFICATIONS - MATERIAL

### Fitting: (specify choice)

Standard: Ductile iron conforming to ASTM A536, Grade 65-45-12.

Optional: Segmentally welded steel as shown under nipples

### Nipples: (specify choice)

¾ – 4"/DN20 – DN100: Carbon steel, Schedule 40, conforming to ASTM A53, Type F

5 – 6"/DN125 – DN150: Carbon steel, Schedule 40, conforming to ASTM A53, Type E or S, Gr. B

8 – 12"/DN200 – DN300: Carbon steel, Schedule 30 or 40, conforming to ASTM A53, Type E or S, Gr. B

### Flanged Adapter Nipples: (specify choice)

Class 125 Flange: Cast iron conforming to ANSI B16.1

Class 150 Flange: Carbon steel conforming to ANSI B16.5, raised or flat face

Class 300 Flange: Carbon steel conforming to ANSI B16.5, raised or flat face

### Fitting Coating: (specify choice)

Standard: Orange enamel

Optional: Hot dip galvanized and others. Some fittings supplied electroplated as standard – see product specifications

### Flanged Adapter Nipple Coating: (specify choice)

Standard: None (Unfinished)

Optional: Orange enamel, hot dip galvanized and others

## 4.0 DIMENSIONS

### Elbows

**No. 10** 90° Elbow

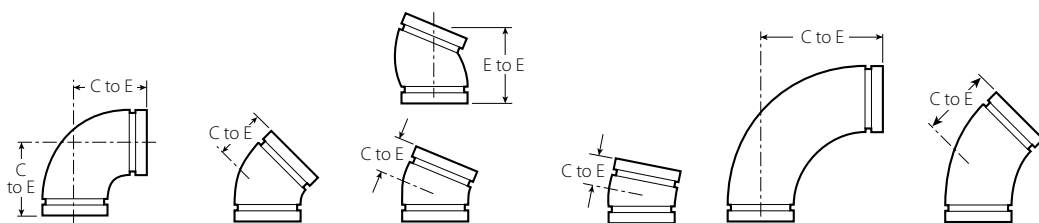
**No. 11** 45° Elbow

**No. 12** 22½° Elbow

**No. 13** 11¼° Elbow

**No. 100** 90° Long  
Radius Elbow

**No. 110** 45° Long  
Radius Elbow



Standard and  
GSNK

Size		No. 10 90° Elbow		No. 11 45° Elbow		No. 12 22½° Elbow		No. 13 11¼° Elbow		No. 100 90° Long Radius Elbow		No. 110 45° Long Radius Elbow	
Nominal	Actual Outside Diameter	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)	C to E	Approx. Wgt. (Each)
inches DN	inches mm	inches mm	lb kg	inches mm	lb kg	inches mm	lb kg	inches mm	lb kg	inches mm	lb kg	inches mm	lb kg
¾ DN20	1.050 26.9	2.25 57	0.5 0.2	1.50 38	0.5 0.2	1.63 (sw) 41	—	1.38 (sw) 35	—	2.50 (sw) 64	0.4 0.2	1.88 (sw) 48	0.3 0.1
1 DN25	1.315 33.7	2.25 57	0.6 0.3	1.75 44	0.6 0.3	3.25 <sup>1</sup> 83	0.6 0.3	1.38 (sw) 35	0.3 0.1	2.88 (sw) 73	0.6 0.3	2.25 (sw) 57	0.5 0.2
1 ¼ DN32	1.660 42.4	2.75 70	1.0 0.5	1.75 44	0.9 0.4	1.75 44	0.8 0.4	1.38 (sw) 35	0.5 0.2	3.25 (sw) 83	1.1 0.5	2.38 (sw) 60	0.7 0.3
1 ½ DN40	1.900 48.3	2.75 70	1.2 0.5	1.75 44	0.9 0.4	1.75 44	0.8 0.4	1.38 (sw) 35	0.5 0.2	3.63 (sw) 92	2.2 1.0	2.50 (sw) 64	1.3 0.6
2 DN50	2.375 60.3	3.25 83	1.8 0.8	2.00 51	1.3 0.6	1.88 48	1.2 0.5	1.38 35	1.0 0.5	4.38 111	2.5 1.1	2.75 70	1.8 0.8
2 ½ DN65	2.875 73.0	3.75 95	3.2 1.5	2.25 57	2.2 1.0	4.00 <sup>1</sup> 102	2.3 1.0	1.50 38	1.1 0.5	5.13 130	3.4 1.5	3.00 76	2.8 1.3
3 DN80	3.000 76.1	3.75 95	3.7 1.7	2.25 57	3.4 1.5	2.25 57	—	1.50 38	—	—	—	—	—
3 ½ DN90	3.500 88.9	4.25 108	4.5 2.0	2.50 64	3.1 1.4	4.50 <sup>1</sup> 114	3.1 1.4	1.50 38	2.1 1.0	5.88 149	6.0 2.7	3.38 86	4.9 2.2
4 DN100	4.000 101.6	4.50 114	5.6 2.5	2.75 70	4.3 2.0	2.50 (sw) 64	4.0 1.8	1.75 (sw) 44	2.7 1.2	—	—	—	—
	4.500 114.3	5.00 127	7.1 3.2	3.00 76	5.6 2.5	2.88 73	5.6 2.5	1.75 44	3.6 1.6	7.50 191	12.3 5.6	4.00 102	7.3 3.3
	4.250 108.0	5.00 127	11.0 5.0	3.00 76	5.6 2.5	—	—	—	—	—	—	—	—
	5.000 127.0	5.25 (sw) 133	10.0 4.5	3.13 (sw) 79	6.0 2.7	3.50 (sw) 89	6.6 3.0	1.88 (sw) 48	4.2 1.9	—	—	—	—
5	5.563 141.3	5.50 140	11.7 5.3	3.25 83	8.3 3.8	2.88 (sw) 73	7.8 3.5	2.00 (sw) 51	5.0 2.2	9.25 (sw) 235	18.0 8.2	4.88 (sw) 124	14.8 6.7
	5.250 133.0	5.50 140	11.7 5.3	3.25 83	8.3 3.8	—	—	—	—	—	—	—	—
DN125	5.500 139.7	5.50 140	11.7 5.3	3.25 83	8.3 3.8	2.88 73	—	2.00 51	—	—	—	—	—
6 DN150	6.625 168.3	6.50 165	17.2 7.8	3.50 89	10.8 4.9	6.25 <sup>1</sup> 159	12.2 5.5	2.00 51	7.0 3.2	10.75 273	30.4 13.8	5.50 140	17.4 7.9
	6.250 159.0	6.50 165	18.6 8.4	3.50 89	10.8 4.9	—	—	—	—	—	—	—	—
	6.500 165.1	6.50 165	15.5 7.0	3.50 89	9.8 4.4	3.13 79	11.4 5.2	2.00 51	7.4 3.4	10.75 (sw) 273	29.0 13.2	5.50 (sw) 140	19.0 8.6

<sup>1</sup> Gooseneck design, end-to-end dimension fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

### NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).



## 4.0 DIMENSIONS (Continued)

### Elbows

**No. 10** 90° Elbow

**No. 11** 45° Elbow

**No. 12** 22½° Elbow

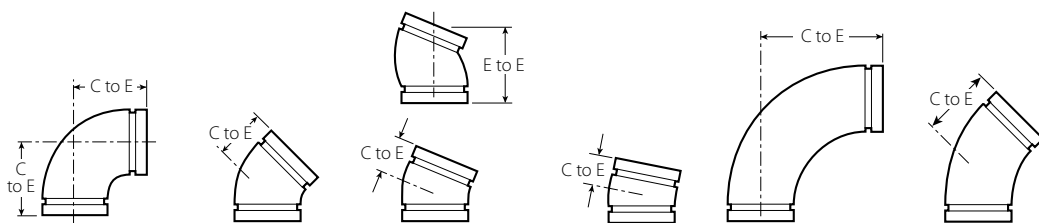
**No. 13** 11¼° Elbow

**No. 100** 90° Long


Radius Elbow

**No. 110** 45° Long

Radius Elbow



Standard and  
GSNK

Size		No. 10 90° Elbow		No. 11 45° Elbow		No. 12 22½° Elbow		No. 13 11¼° Elbow		No. 100 90° Long Radius Elbow		No. 110 45° Long Radius Elbow	
Nominal inches DN	Actual Outside Diameter inches mm	C to E inches mm	Approx. Wgt. (Each) lb kg	C to E inches mm	Approx. Wgt. (Each) lb kg	C to E inches mm	Approx. Wgt. Each lb kg	C to E inches mm	Approx. Wgt. (Each) lb kg	C to E inches mm	Approx. Wgt. (Each) lb kg	C to E inches mm	Approx. Wgt. (Each) lb kg
8 DN200	8.625 219.1	7.75 197	29.9 13.6	4.25 108	20.4 9.3	7.75 <sup>1</sup> 197	20.0 9.1	2.00 51	10.1 4.6	14.25 362	66.0 30.0	7.25 184	36.0 16.3
10 DN250	10.750 273.0	9.00 229	63.3 28.7	4.75 121	37.5 17.0	4.38 (sw) 111	30.0 13.6	2.13 54	11.8 5.3	15.00 381	107.0 48.5	6.25 159	57.0 25.9
12 DN300	12.750 323.9	10.00 254	74.0 33.6	5.25 133	66.7 30.3	4.88 (sw) 124	40.0 18.1	2.25 57	29.3 13.3	18.00 457	156.0 70.8	7.50 191	90.0 40.8
14 <sup>2</sup> DN350	14.000 355.6	14.00 356	136.0 61.7	5.75 146	65.0 29.5	5.00 (sw) 127	46.0 20.9	3.50 (sw) 89	32.0 14.5	21.00 (s) 533	164.0 74.4	8.75 222	82.0 37.2
	14.843 377.0	14.84 377	149.3 67.7	6.13 156	82.0 37.2	—	—	—	—	—	—	—	—
16 <sup>2</sup> DN400	16.000 406.5	16.00 406	171.0 77.6	6.63 168	88.0 39.3	5.00 (sw) 127	58.0 26.3	4.00 (sw) 102	42.0 19.1	24.00 (s) 610	210.0 95.3	10.00 (s) 254	100.0 45.4
	16.773 426.0	16.75 425	198.6 90.1	7.00 178	101.3 45.9	—	—	—	—	—	—	—	—
18 <sup>2</sup> DN450	18.000 457.2	18.00 457	228.0 103.4	7.50 190	108.0 50.0	5.50 (sw) 140	65.0 29.5	4.50 (sw) 144	53.2 24.1	27.00 (s) 686	273.0 123.8	11.25 (s) 286	135.0 61.2
	18.898 480.0	18.88 480	291.0 132.0	7.83 200	141.7 64.3	—	—	—	—	—	—	—	—
20 <sup>2</sup> DN500	20.000 508.0	20.00 508	298.0 135.2	8.25 210	138.0 62.6	6.00 (sw) 152	78.6 36.0	5.00 (sw) 127	65.0 29.5	30.00 (s) 762	343.0 155.6	12.50 (s) 318	174.0 78.9
	20.866 530.0	20.88 530	355.0 161.0	8.63 219	179.0 81.2	—	—	—	—	—	—	—	—
24 <sup>2</sup> DN600	24.000 609.6	24.00 610	438.0 198.7	10.00 254	221.0 100.2	7.00 (sw) 178	140.0 63.5	6.00 (sw) 152	60.0 27.2	36.00 (s) 914	516.0 234.1	15.00 (s) 381	251.0 113.9
	24.803 630.0	24.80 630	545.0 247.2	10.25 261	255.2 115.7	—	—	—	—	—	—	—	—
14 – 60 DN350 – DN1500	For AGS fitting information, see <a href="#">publication 20.05</a> 												

<sup>1</sup> Gooseneck design, end-to-end dimension fittings in this size, contact your nearest Victaulic sales representative.

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

### NOTE

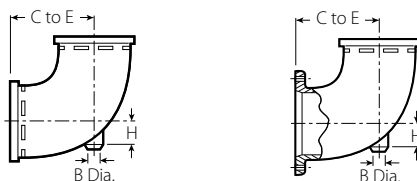
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.1 DIMENSIONS

### Reducing Base Support Elbow

No. R-10G Grv. x Grv.

No. R-10F Grv. x Flange



Size			No. R-10 Reducing Base Support Elbow			Approx. Weight Each	
Nominal inches DN			C to E inches mm	H inches mm	B Diameter inches mm	Grv. x Grv. lb kg	Grv. x Flange lb kg
6 DN150	x	4 DN100	9.00 229	1.25 32	1.50 38	19.0 8.6	33.0 15.0
		5	9.00 229	1.50 38	1.50 38	23.0 10.4	38.0 17.2
8 DN200	x	6 DN150	10.50 267	2.13 24	1.50 38	33.0 15.0	52.0 23.6
10 DN250	x	8 DN200	12.00 305	2.40 61	1.50 38	61.0 27.7	88.0 39.9

## 4.2 DIMENSIONS

### Adapter Elbow

No. 18 90° Adapter Elbow

No. 19 45° Adapter Elbow



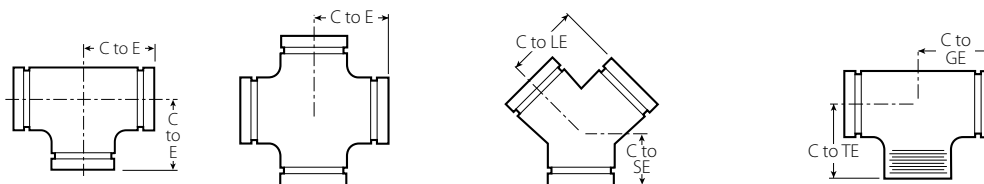
Size		No. 18 90° Adapter Elbow			No. 19 45° Adapter Elbow		
Nominal inches DN	Actual Outside Diameter inches mm	C to GE inches mm	C to TE inches mm	Approximate Weight (Each) lb kg	C to GE inches mm	C to TE inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	2.25 57	2.25 57	0.5 0.2	1.50 38	1.50 38	0.5 0.2
1 DN25	1.315 33.7	2.25 57	2.25 57	0.5 0.2	—	—	—
1¼ DN32	1.660 42.4	2.75 70	2.75 70	0.9 0.4	—	—	—
1½ DN40	1.900 48.3	2.75 70	2.75 70	1.1 0.5	1.75 44	1.75 44	0.9 0.4
2 DN50	2.375 60.3	3.25 83	4.25 108	2.5 1.1	—	—	—
2½ DN65	2.875 73.0	3.75 95	3.75 95	3.0 1.4	2.25 57	2.25 57	2.3 1.0
3 DN80	3.500 88.9	4.25 108	6.00 152	5.8 2.6	2.50 64	4.25 108	5.0 2.3
3½ DN90	4.000 101.6	4.50 114	6.25 159	8.0 3.6	5.25 133	5.25 133	8.8 4.0
6 DN150	6.625 168.3	6.50 165	6.50 165	17.6 8.0	3.50 89	3.50 89	12.7 5.8

#### NOTE

- Available with British Standard Pipe Threads, specify "BSP" clearly on order.

## 4.3 DIMENSIONS

### Tees, Crosses and True Wyes



Size		No. 20 Tee		No. 35 Cross (sw)		No. 33 True Wye (sw)			No. 29M Tee with Threaded Branch		
Nominal inches DN	Actual Outside Diameter inches mm	C to E inches mm	Approx. Weight (Each) lb kg	C to E inches mm	Approx. Weight (Each) lb kg	C to LE inches mm	C to SE inches mm	Approx. Weight (Each) lb kg	C to GE inches mm	C to TE inches mm	Approx. Weight (Each) lb kg
3/4 DN20	1.050 26.9	2.25 57	0.6 0.3	2.25 57	0.9 0.4	2.25 57	2.00 51	0.7 0.3	2.25 57	2.25 (sw) 57	0.6 0.3
1 DN25	1.315 33.7	2.25 57	1.0 0.5	2.25 57	1.3 0.6	2.25 57	2.25 57	1.1 0.5	2.25 57	2.25 57	1.0 0.5
1 1/4 DN32	1.660 42.4	2.75 70	1.5 0.7	2.75 70	2.1 1.0	2.75 70	2.50 64	1.5 0.7	2.75 70	2.75 70	1.5 0.7
1 1/2 DN40	1.900 48.3	2.75 70	2.0 0.9	2.75 70	2.5 1.1	2.75 70	2.75 70	1.8 0.8	2.75 70	2.75 70	2.0 0.9
2 DN50	2.375 60.3	3.25 83	3.0 1.4	3.25 83	3.8 1.7	3.25 83	2.75 70	2.5 1.1	3.25 83	4.25 108	3.0 1.4
2 1/2	2.875 73.0	3.75 95	4.3 2.0	3.75 95	6.1 2.8	3.75 95	3.00 76	4.3 2.0	3.75 95	3.75 95	4.3 2.0
DN65	3.000 76.1	3.75 95	5.2 2.4	—	—	—	—	—	3.75 95	3.75 (sw) 95	5.2 2.4
3 DN80	3.500 88.9	4.25 108	6.8 3.0	4.25 108	10.5 4.8	4.25 108	3.25 83	6.1 2.8	4.25 108	6.00 152	6.8 3.1
3 1/2 DN90	4.000 101.6	4.50 (sw) 114	7.9 3.6	4.50 114	11.5 5.2	4.50 114	3.50 89	9.6 4.4	4.50 114	4.50 (sw) 114	7.9 3.6
	4.250 108.0	5.00 127	15.5 7.0	—	—	—	—	—	5.00 127	5.00 (sw) 127	15.5 7.0
4 DN100	4.500 114.3	5.00 127	11.9 5.4	5.00 127	15.8 7.2	5.00 127	3.75 95	9.8 4.4	5.00 127	7.25 184	11.9 5.4
	5.000 127.0	5.25 (sw) 133	15.0 6.8	5.25 133	18.5 8.4	—	—	—	5.25 133	5.25 (sw) 133	15.0 6.8
	5.250 133.0	5.50 140	17.8 8.1	—	—	—	—	—	5.50 140	5.50 (sw) 140	17.8 8.1
DN125	5.500 139.7	5.50 140	17.8 8.1	—	—	—	—	—	5.50 140	5.50 (sw) 140	17.8 8.1
5	5.563 141.3	5.50 140	17.8 8.1	5.50 140	20.0 9.1	5.50 140	4.00 102	15.0 6.8	5.50 140	5.50 (sw) 140	17.8 8.1
	6.250 159.0	6.50 165	27.1 12.3	—	—	—	—	—	6.50 165	6.50 (sw) 165	27.1 12.3
	6.500 165.1	6.50 165	22.0 10.0	6.50 165	28.0 12.7	—	—	—	6.50 165	6.50 (sw) 165	22.0 10.0
6 DN150	6.625 168.3	6.50 165	25.7 11.7	6.50 165	28.0 12.7	6.50 165	4.50 114	22.3 10.1	6.50 165	6.50 (sw) 165	25.7 11.7
8 DN200	8.625 219.1	7.75 197	47.6 21.6	7.75 197	48.0 21.8	7.75 197	6.00 152	36.0 16.3	7.75 197	7.75 197	47.6 21.6
10 DN250	10.750 273.0	9.00 229	99.0 44.9	9.00 229	121.5 55.1	9.00 229	6.50 155	69.9 31.7	9.00 229	9.00 229	99.0 44.9
12 DN300	12.750 323.9	10.00 254	133.0 60.3	10.00 254	110.0 49.9	10.00 254	7.00 178	80.0 36.3	10.00 254	10.00 254	133.0 60.3

(s) = Carbon Steel Direct Roll Groove (OGS)

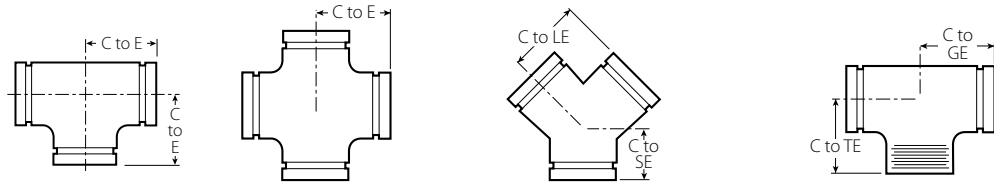
(sw) = Carbon Steel Segmentally Welded


#### NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

### 4.3 DIMENSIONS (Continued)

#### Tees, Crosses and True Wyes



Size		No. 20 Tee		No. 35 Cross (sw)		No. 33 True Wye (sw)			No. 29M Tee with Threaded Branch		
Nominal inches DN	Actual Outside Dimeter inches mm	C to E inches mm	Approx. Weight (Each) lb kg	C to E inches mm	Approx. Weight (Each) lb kg	C to LE inches mm	C to SE inches mm	Approx. Weight (Each) lb kg	C to GE inches mm	C to TE inches mm	Approx. Weight (Each) lb kg
14 <sup>2</sup> DN350	14.000 355.6	11.00 (sw) 279	145.0 65.8	11.00 279	198.0 89.8	11.00 279	7.50 191	134.2 60.8	—	—	—
	377.0	11.50 292	145.0 65.8	—	—	—	—	—	—	—	—
16 <sup>2</sup> DN400	16.000 406.4	12.00 (sw) 305	186.0 84.4	12.00 305	250.0 113.4	12.00 305	8.00 203	167.0 75.7	—	—	—
	426.0	13.00 300	186.0 84.4	—	—	—	—	—	—	—	—
18 <sup>2</sup> DN450	18.000 457.0	15.50 (sw) 394	260.0 117.9	15.50 394	350.0 158.8	15.50 394	8.50 216	234.0 106.1	—	—	—
	480.0	14.63 372	256.0 116.1	—	—	—	—	—	—	—	—
20 <sup>2</sup> DN500	20.000 508.0	17.25 (sw) 438	336.0 152.4	17.25 438	452.0 205.0	17.25 438	9.00 229	281.0 127.5	—	—	—
	530.0	15.38 (sw) 391	339.0 153.8	—	—	—	—	—	—	—	—
24 <sup>2</sup> DN600	24.000 610.0	20.00 (sw) 508	592.0 268.5	20.00 508	795.0 360.6	20.00 508	10.00 254	523.0 237.2	—	—	—
	630.0	17.38 (sw) 441	473.0 214.5	—	—	—	—	—	—	—	—
14 – 60 DN350 – DN1500		For AGS fitting information, see <a href="#">publication 20.05</a> 									

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

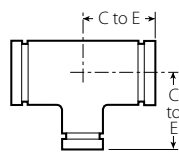
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.4 DIMENSIONS

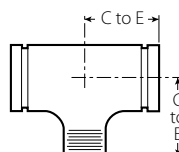
### Reducing Tee

No. 25 Grooved Branch

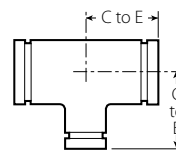
No. 29T Threaded Branch



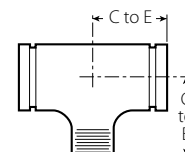
No. 25



No. 29T



No. 25



No. 29T

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	
1 DN25	x	1 DN25	2.25 (sw) 57	2.25 (sw) 57	1.0 0.5
1 1/4 DN32	x	1 1/4 DN32	2.75 (sw) 70	2.75 (sw) 70	1.3 0.6
1 1/2 DN40	x	1 1/2 DN40	2.75 (sw) 70	2.75 (sw) 70	1.5 0.7
		1 DN25	2.75 (sw) 70	2.75 (sw) 70	1.5 0.7
		1 1/4 DN32	2.75 (sw) 70	2.75 (sw) 70	1.7 0.8
2 DN50	x	2 DN50	3.25 83	3.25 83	2.5 1.1
		1 DN25	3.25 83	3.25 83	2.7 1.2
		1 1/4 DN32	3.25 (sw) 83	3.25 (sw) 83	1.8 0.8
		1 1/2 DN40	3.25 83	3.25 (sw) 83	3.0 1.4
2 1/2	x	2 1/2	3.75 (sw) 95	3.75 (sw) 95	3.9 1.8
		1 DN25	3.75 95	3.75 (sw) 95	3.8 1.7
		1 1/4 DN32	3.75 95	3.75 95	4.2 1.7
		1 1/2 DN40	3.75 95	3.75 95	3.9 1.8
		2 DN50	3.75 95	3.75 (sw) 95	4.5 2.0
3 DN80	x	3 DN80	4.25 (sw) 108	4.25 (sw) 108	5.7 2.6
		1 DN25	4.25 108	4.25 108	6.1 2.8
		1 1/4 DN32	4.25 108	4.25 108	8.0 3.6
		1 1/2 DN40	4.25 108	4.25 (sw) 108	6.5 2.9
		2 DN50	4.25 108	4.25 (sw) 108	6.2 2.8
		2 1/2	4.25 108	4.25 (sw) 108	6.4 2.9

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

- Cast fitting available. Contact Victaulic for details.

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	
4 DN100	x	4 DN100	5.00 (sw) 127	5.00 (sw) 127	8.0 3.6
		1 DN25	5.00 127	5.00 127	7.8 3.5
		1 1/4 DN32	5.00 (sw) 127	5.00 (sw) 127	9.6 4.4
		1 1/2 DN40	5.00 127	5.00 127	10.2 4.6
		2 DN50	5.00 127	5.00 127	11.2 5.1
		2 1/2	5.00 127	5.00 127	11.4 5.2
		3 DN80	5.00 127	5.00 127	11.6 5.3
5	x	5	5.50 (sw) 140	5.50 (sw) 140	14.0 6.4
		1 1/2 DN40	5.50 (sw) 140	5.50 (sw) 140	14.3 6.5
		2 DN50	5.50 (sw) 140	5.50 (sw) 140	14.5 6.6
		2 1/2	5.50 140	5.50 (sw) 140	15.2 6.9
		3 DN80	5.50 140	5.50 (sw) 140	16.6 7.5
		4 DN100	5.50 140	5.50 (sw) 140	16.7 7.6
6 DN150	x	6 DN150	6.50 (sw) 165	6.50 (sw) 165	23.0 10.4
		1 1/2 DN40	6.50 (sw) 165	6.50 (sw) 165	24.0 10.9
		2 DN50	6.50 165	6.50 165	21.6 9.8
		2 1/2	6.50 165	6.50 165	21.4 11.7
		3 DN80	6.50 165	6.50 165	26.5 12.0
		4 DN100	6.50 165	6.50 165	25.0 11.3
		5	6.50 165	6.50 165	23.2 10.5
6 1/2	x	6 1/2	6.50 165	6.50 (sw) 165	24.0 10.9
		3 DN80	6.50 165	6.50 (sw) 165	25.0 11.3
		4 DN100	6.50 165	6.50 (sw) 165	25.0 11.3

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

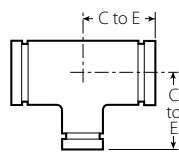
- Cast fitting available. Contact Victaulic for details.

## 4.4 DIMENSIONS (Continued)

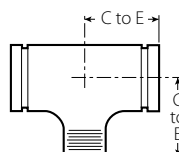
### Reducing Tee

No. 25 Grooved Branch

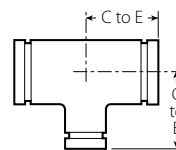
No. 29T Threaded Branch



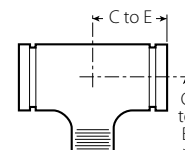
No. 25



No. 29T



No. 25



No. 29T

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	lb kg
8 DN200	x	8 DN200	1 1/2 DN40	7.75 (sw)	33.0
				197	15.0
				7.75 (sw)	33.5
				197	15.2
				2 1/2	39.0
				197	17.7
				3	33.6
				197	15.2
				4	41.8
				197	19.0
				5	34.0
				197	15.4
				6	42.3
				197	19.2
			165.1mm	7.75 (sw)	48.0
				197	21.8
10 DN250	x	10 DN250	1 1/2 DN40	9.00	62.0
				229	28.1
				2	62.0
				DN50	28.1
				2 1/2	62.4
				229	28.3
				3	60.0
				DN80	27.2
				4	61.0
				DN100	27.7
				5	52.0
				229	23.6
				6	59.0
				DN150	26.8
				8	64.7
				DN200	29.3

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

- Cast fitting available. Contact Victaulic for details.

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	lb kg
12 DN300	x	12 DN300	1 DN25	10.00 (sw)	77.0
				254	34.9
				2	80.0
				DN50	36.3
				2 1/2	78.0
				254	35.4
				3	82.0
				DN80	37.2
				4	80.0
				DN100	36.3
				5	75.0
				254	34.0
				6	75.0
				DN150	34.0
				8	80.0
				DN200	36.3
				10	84.0
				DN250	38.1
14 <sup>2</sup> DN350	x	14 DN350	4 DN100	11.00 (sw)	102.0
				279	46.3
				6	108.2
				DN150	49.1
				8	112.0
				DN200	50.8
				10	120.0
				DN250	54.4
				12	129.1
				DN300	58.6
16 <sup>2</sup> DN400	x	16 DN400	4 DN100	12.00	130.0
				305	59.0
				6	133.5
				DN150	60.6
				8	145.0
				DN200	65.8
				10	149.5
				DN250	67.8
				12	154.0
				DN300	69.9
				14	167.0
				DN350	75.8

- <sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

- Cast fitting available. Contact Victaulic for details.

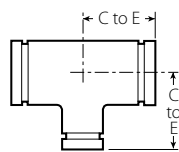


## 4.4 DIMENSIONS (Continued)

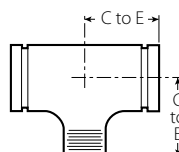
### Reducing Tee

No. 25 Grooved Branch

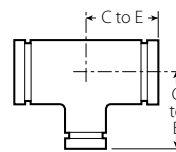
No. 29T Threaded Branch



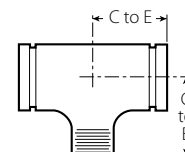
No. 25



No. 29T



No. 25



No. 29T

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	lb kg
18 <sup>2</sup> DN450	x	18 DN450	4 DN100	15.50 (sw) 394	194.0 88.0
			6 DN150	15.50 (sw) 394	200.0 90.7
			8 DN200	15.50 (sw) 394	202.0 91.6
			10 DN250	15.50 394	212.0 96.2
			12 DN300	15.50 394	222.6 101.0
			14 DN350	15.50 394	230.1 104.4
			16 DN400	15.50 394	247.6 112.3
			6 DN150	17.25 438	240.0 108.9
			8 DN200	17.25 438	244.0 110.7
			10 DN250	17.25 438	256.0 116.1
20 <sup>2</sup> DN500	x	20 DN500	12 DN300	17.25 438	264.0 119.8
			14 DN350	17.25 438	275.0 124.7
			16 DN400	17.2 5 438	288.6 130.9
			18 DN450	17.25 438	297.0 134.7

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

- Cast fitting available. Contact Victaulic for details.

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each)
Nominal inches DN			C to E inches mm	C to E inches mm	lb kg
24 <sup>2</sup> DN600	x	24 DN600	8 DN200	20.00 508	340.0 154.2
			10 DN250	20.00 508	343.9 156.0
			12 DN300	20.00 508	352.8 160.0
			14 DN350	20.00 508	360.0 163.3
			16 DN400	20.00 508	378.0 171.5
			18 DN450	20.00 508	380.0 172.4
			20 DN500	20.00 508	373.0 169.2
			14 – 60 DN350 – 1500	For AGS fitting information, see <a href="#">publication 20.05</a>	
				<b>AGS</b> <sup>TM</sup>	

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

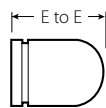
#### NOTES

- No. 29T Threaded Outlet Reducing Tees are supplied NPT and are available with British Standard threads. For British Standard specify "BSP" clearly on order.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).
- Cast fitting available. Contact Victaulic for details.

## 4.5 DIMENSIONS

### Bull Plug

#### No. 61



No. 61

Size		No. 61 Bull Plug (s)	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg
2 DN50	2.375 60.3	4.00 102	2.5 1.1
2 ½	2.875 73.0	5.00 127	3.0 1.4
3 DN80	3.500 88.9	6.00 152	4.5 2.0
4 DN100	4.500 114.3	7.00 178	7.5 3.4
5	5.563 141.3	8.00 203	12.0 5.4
6 DN150	6.625 168.5	10.00 254	17.0 7.7

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

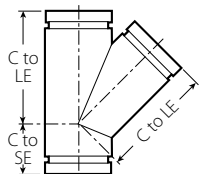
#### NOTES

- Steel dish caps available through 24"/DN600, contact Victaulic.
- No. 61 Bull Plugs should be used in vacuum service with Style 72 or 750 couplings.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

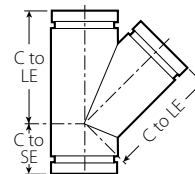
## 4.6 DIMENSIONS

### 45° Lateral

#### No. 30



No. 30



No. 30

Size		No. 30 45° Lateral		Weight
Nominal inches DN	Actual Outside Diameter inches mm	C to LE inches mm	C to SE inches mm	Approx. (Each) lb kg
¾ DN20	1.050 26.9	4.50 (sw) 114	2.00 (sw) 51	1.0 0.5
1 DN25	1.315 33.7	5.00 (sw) 127	2.25 (sw) 57	1.7 0.8
1¼ DN32	1.660 42.4	5.75 146	2.50 64	2.5 (d) 1.1
1½ DN40	1.900 48.3	6.25 (sw) 159	2.75 (sw) 70	3.5 1.6
2 DN50	2.375 60.3	7.00 (sw) 178	2.75 (sw) 70	5.0 2.3
2½	2.875 73.0	7.75 (sw) 197	3.00 (sw) 76	9.0 4.1
DN65	3.000 76.1	8.50 (sw) 216	3.25 (sw) 83	11.0 5.0
3 DN80	3.500 88.9	8.50 216	3.25 83	11.7 (d) 5.4
3½ DN90	4.000 101.6	10.00 (sw) 254	3.50 (sw) 89	17.8 8.1
4 DN100	4.500 114.3	10.50 267	3.75 95	22.2 (d) 10.1
5	5.563 141.3	12.50 (sw) 318	4.00 (sw) 102	21.8 9.9

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

Size		No. 30 45° Lateral		Weight
Nominal inches DN	Actual Outside Diameter inches mm	C to LE inches mm	C to SE inches mm	Approx. (Each) lb kg
	6.500 165.1	14.00 (sw) 356	4.50 (sw) 114	43.6 19.8
6 DN150	6.625 168.3	14.00 (sw) 356	4.50 (sw) 114	43.6 19.8
8 DN200	8.625 219.1	18.00 (sw) 457	6.00 (sw) 152	72.0 32.7
10 DN250	10.750 273.0	20.50 (sw) 521	6.50 (sw) 165	105.0 47.6
12 DN300	12.750 323.9	23.00 (sw) 584	7.00 (sw) 178	165.0 74.8
14² DN350	14.000 355.6	26.50 (sw) 673	7.50 (sw) 191	276.0 125.2
16² DN400	16.000 406.4	29.00 (sw) 737	8.00 (sw) 203	344.2 156.1
18² DN450	18.000 457.0	32.00 (sw) 813	8.50 (sw) 216	429.0 194.6
20² DN500	20.000 508.0	35.00 (sw) 889	9.00 (sw) 229	500.0 226.8
24² DN600	24.000 610.0	40.00 (sw) 1016	10.00 (sw) 254	715.0 324.3
14 – 60 DN350 – DN1500		For AGS fitting information, see <a href="#">publication 20.05</a>		



<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

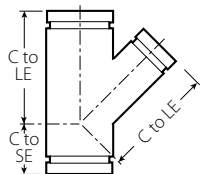
#### NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.7 DIMENSIONS

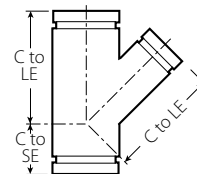
### 45° Reducing Lateral

#### No. 30-R




No. 30-R

Size				No 30-R 45° Reducing Lateral		
Nominal inches DN				C to LE inches mm	C to SE inches mm	Approx. Weight (Each) lb kg
3 DN80	x	3 DN80	2 DN50	8.50 216	3.25 83	9.8 4.4
			2½	8.50 216	3.25 83	9.8 4.4
4 DN100	x	4 DN100	2 DN50	10.50 267	3.75 95	10.0 4.5
			2½	10.50 267	3.75 95	10.0 4.5
			3 DN80	10.50 267	3.75 95	18.3 8.3
5	x	5	2 DN50	12.50 318	4.00 102	24.0 10.9
			3 DN80	12.50 318	4.00 102	27.0 12.2
			4 DN100	12.50 318	4.00 102	26.5 12.0
6 DN150	x	6 DN150	3 DN80	14.00 356	4.50 114	37.0 16.8
			4 DN100	14.00 356	4.50 114	36.0 16.3
			5	14.00 356	4.50 114	44.7 20.3
8 DN200	x	8 DN200	4 DN100	18.00 457	6.00 152	62.0 28.1
			5	18.00 457	6.00 152	75.5 34.2
			6 DN150	18.00 457	6.00 152	82.0 37.2
10 DN250	x	10 DN250	4 DN100	20.50 521	6.50 165	104.8 47.5
			5	20.50 521	6.50 165	99.0 44.9
			6 DN150	20.50 521	6.50 165	105.8 48.0
			8 DN200	20.50 521	6.50 165	118.0 53.5
12 DN300	x	12 DN300	5	23.00 584	7.00 178	122.0 55.3
			6 DN150	23.00 584	7.00 178	137.0 62.1
			8 DN200	23.00 584	7.00 178	147.0 66.7
			10 DN250	23.00 584	7.00 178	167.0 75.8



No. 30-R

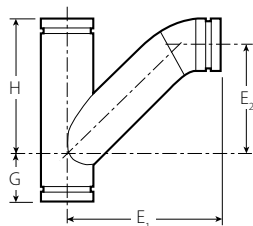
Size				No 30-R 45° Reducing Lateral		
Nominal inches DN				C to LE inches mm	C to SE inches mm	Approx. Weight (Each) lb kg
14 <sup>2</sup> DN350	x	14 DN350	4 DN100	26.50 673	7.50 191	172.0 78.0
			6 DN150	26.50 673	7.50 191	187.0 84.8
			8 DN200	26.50 673	7.50 191	205.8 93.4
			10 DN250	26.20 673	7.50 191	235.0 106.6
			12 DN300	26.50 673	7.50 191	250.0 113.4
			16 <sup>2</sup> DN400	x	16 DN400	6 DN150
8 DN200	29.00 737	8.00 203				252.5 114.5
10 DN250	29.00 737	8.00 203				265.0 120.2
12 DN300	29.00 737	8.00 203				295.0 133.8
14 DN350	29.00 737	8.00 203				305.0 138.3
18 <sup>2</sup> DN450	x	18 DN450				6 DN150
			8 DN200	32.00 813	8.50 216	275.0 124.7
			12 DN300	32.00 813	8.50 216	347.0 157.4
			14 DN350	32.00 813	8.50 216	350.0 158.8
			16 DN400	32.00 813	8.50 216	362.0 164.2
			20 <sup>2</sup> DN500	x	20 DN500	12 DN300
14 DN350	35.00 889	9.00 229				420.0 190.5
16 DN400	35.00 899	10.00 229				425.0 192.8
24 <sup>2</sup> DN600	x	24 DN600				16 DN400
			20 DN600	40.00 1016	10.00 254	570.0 258.6
14 – 60 DN350 – DN1500				For AGS fitting information, see <a href="#">publication 20.05</a> 		

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

## 4.8 DIMENSIONS

### Tee Wye

#### No. 32



No. 32

Size			No. 32 Tee Wye (sw)					Approx. Weight (Each)
Nominal inches DN			G inches mm	H inches mm	E <sub>1</sub> inches mm	E <sub>2</sub> inches mm		
2 DN50	x	2 DN50	2.75 70	7.00 178	9.00 229	4.63 118	6.4 2.9	
2½	x	2½	3.00 76	7.75 197	10.50 267	5.75 146	11.5 5.2	
3 DN80	x	3 DN80	3.25 83	8.50 216	11.50 292	6.50 165	14.3 6.5	
3½ DN90	x	3½ DN90	3.25 89	10.00 254	13.00 330	7.75 197	22.9 10.4	
4 100	x	4 DN100	3.75 95	10.50 267	13.63 346	8.13 207	26.0 11.8	
5	x	5	4.00 102	12.50 318	16.13 410	10.00 254	48.0 21.8	
6 DN150	x	6 DN150	4.50 114	14.00 356	18.25 464	11.50 292	60.5 27.4	
8 DN200	x	8 DN200	6.00 152	18.00 457	23.25 591	15.25 387	127.1 57.7	
10 DN250	x	10 DN250	6.50 165	20.50 521	27.25 692	18.00 457	190.0 86.2	
12 DN300	x	12 DN300	7.00 178	23.00 584	31.00 787	20.50 521	240.0 108.9	

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

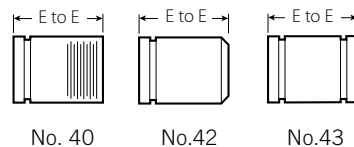
## 4.9 DIMENSIONS

### Adapter Nipple

No. 40<sup>12</sup> Grv. x Thd.

No. 42 Grv. x Bev.

No. 43 Grv. x Grv.



No. 40

No. 42

No. 43

Size		No. 40, 42, 43 Adapter Nipple (s)	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	3.00 76	0.3 0.1
1 25	1.315 33.7	3.00 76	0.4 0.2
1¼ DN32	1.660 42.4	4.00 102	0.8 0.4
1½ 40	1.900 48.3	4.00 102	0.9 0.4
2 DN50	2.375 60.3	4.00 102	1.2 0.5
2½	2.875 73.0	4.00 102	1.9 0.9
3 DN80	3.500 88.9	4.00 102	2.5 1.1
3½ DN90	4.000 101.6	4.00 102	2.1 0.9
4 DN100	4.500 114.3	6.00 152	5.5 2.5
5	5.563 141.3	6.00 152	7.4 3.4
6 DN150	6.625 168.3	6.00 152	9.5 4.3
8 DN200	8.625 219.1	6.00 152	14.2 6.4
10 DN250	10.750 273.0	8.00 203	27.0 12.2
12 DN300	12.750 323.9	8.00 203	33.0 15.0

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

### NOTES

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).
- For pump package nipples with 1 ½/40 mm hole cut to receive Style 923 Vic-Let or Style 924 Vic-O-Well request special No. 40, 42 or 43 nipples and specify No. 40-H, 42-H or 43-H on order. NOTE: 4 – 12"/DN100 – DN300 diameter — 8"/200 mm minimum length required.
- For roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.
- Available with British Standard Pipe Threads, specify "BSP" clearly on order.



## 4.10 DIMENSIONS

### Cap

#### No. 60




No. 60



No. 60

Size		No. 60 Cap	
Nominal inches DN	Actual Outside Diameter inches mm	"T" Thickness inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	0.88 22	0.2 0.1
1 25	1.315 33.7	0.88 22	0.3 0.1
1¼ DN32	1.660 42.4	0.88 22	0.3 0.1
1½ DN40	1.900 48.3	0.88 22	0.5 0.2
2 DN50	2.375 60.3	0.88 22	0.6 0.3
2½	2.875 73.0	0.88 22	1.0 0.5
DN65	3.000 76.1	0.88 22	1.2 0.5
3 DN80	3.500 88.9	0.88 22	1.2 0.5
3½ DN90	4.000 101.6	0.88 22	2.5 1.1
	4.250 108.0	1.00 25	2.3 1.0
4 DN100	4.500 114.3	1.00 25	2.5 1.1
	5.250 133.0	1.00 25	4.5 2.0
DN125	5.500 139.7	1.00 25	4.5 2.0
5	5.563 141.3	1.00 25	4.6 2.1

Size		No. 60 Cap	
Nominal inches DN	Actual Outside Diameter inches mm	"T" Thickness inches mm	Approx. Weight (Each) lb kg
	6.250 159.0	1.00 25	6.8 3.1
	6.500 165.1	1.00 25	7.3 3.3
6 DN150	6.625 168.3	1.00 25	6.1 2.8
8 DN200	8.625 219.1	1.19 30	13.1 5.9
10 DN250	10.750 273.0	1.25 32	21.0 9.5
12 DN300	12.750 323.9	1.25 32	35.6 16.2
14 <sup>2</sup> DN350	14.000 355.6	9.50 (s) 241	+
16 <sup>2</sup> DN400	16.000 406.4	10.00 (s) 254	+
18 <sup>2</sup> DN450	18.000 457.0	11.00 (s) 279	+
20 <sup>2</sup> DN500	20.000 508.0	12.00 (s) 305	+
24 <sup>2</sup> DN600	24.000 610.0	13.50 (s) 343	+
14 – 60 DN350 – DN1500	For AGS fitting information, see <a href="#">publication 20.05</a> 		

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details.

#### NOTES

- No. 60 cap is not suitable for use in vacuum service with Style 72 or 750 couplings. No. 61 bull plugs should be used.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.11 DIMENSIONS

### Flanged Adapter Nipple

**No. 41** ANSI Class 125

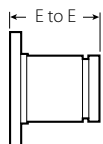
**No. 45F** ANSI Class 150 Flat Face

**No. 45R** ANSI Class 150 Raised Face

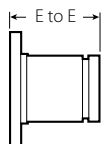
**No. 46F** ANSI Class 300 Flat Face

**No. 46R** ANSI Class 300 Raised Face

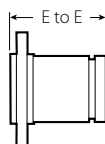
**No. 45RE** PN10/PN16 Raised Face



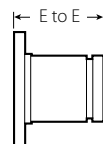
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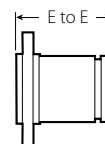
No. 45F



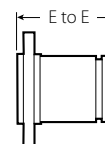
No. 45R



No. 46F



No. 46R



No. 45RE

Size		No. 41 ANSI 125 Flange Adapter Nipple		No. 45F and No. 45R ANSI 150 Flanged Adapter Nipple (s)		No. 46F and No. 46R ANSI 300 Flanged Adapter Nipple (s)		No. 45RE Flanged Adapter Nipple	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	3.00 76	—	3.00 76	2.3 1.0	3.00 76	3.3 1.5	—	—
1 DN25	1.315 33.7	3.00 76	2.5 1.1	3.00 76	2.7 1.2	3.00 76	3.9 1.8	—	—
1¼ DN32	1.660 42.4	4.00 102	3.0 1.4	4.00 102	3.3 1.5	4.00 102	4.8 2.2	—	—
1½ DN40	1.900 48.3	4.00 102	3.5 1.6	4.00 102	3.9 1.8	4.00 102	6.9 3.1	—	—
2 DN50	2.375 60.3	4.00 102	5.5 2.5	4.00 102	6.0 2.7	4.00 102	8.2 3.7	2.50 64	5.3 2.4
2½	2.875 73.0	4.00 102	8.0 3.6	4.00 102	9.9 4.5	4.00 102	11.9 5.4	—	—
DN65	3.000 76.1	—	—	—	—	—	—	2.50 64	6.5 2.9
3 DN80	3.500 88.9	4.00 102	9.5 4.3	4.00 102	11.7 5.3	4.00 102	16.5 7.5	2.50 64	8.2 3.7
3½ DN90	4.000 101.6	4.00 102	12.0 5.4	4.00 102	15.1 6.8	4.00 102	20.1 9.1	—	—
4 DN100	4.500 114.3	6.00 152	16.7 7.6	6.00 152	18.5 8.4	6.00 152	27.4 12.4	2.75 70	10.0 45
5	5.563 141.3	6.00 152	21.5 9.8	6.00 152	21.3 9.7	6.00 152	35.3 16.0	—	—
DN125	5.500 139.7	—	—	—	—	—	—	2.75 70	16.3 7.4
6 DN150	6.625 168.3	6.00 152	26.5 12.0	6.00 152	27.5 12.5	6.00 152	47.5 21.5	2.75 70	16.3 7.4
	6.500 165.1	—	—	—	—	—	—	—	—
8 DN200	8.625 219.1	6.00 152	39.0 17.7	6.00 152	41.3 18.8	6.00 152	70.3 31.9	—	—
10 DN250	10.750 273.0	8.00 203	57.0 25.9	8.00 203	59.3 27.1	8.00 203	100.8 45.7	—	—
12 DN300	12.750 323.9	8.00 203	41.0 18.6	8.00 203	40.0 40.0	8.00 203	146.2 66.3	—	—
14 <sup>2</sup> DN350	14.000 355.6	8.00 203	—	8.00 203	+	8.00 203	+	—	—
16 <sup>2</sup> DN400	16.000 406.4	8.00 203	—	8.00 203	+	8.00 203	+	—	—
18 <sup>2</sup> DN450	18.000 457.0	8.00 203	—	8.00 203	+	8.00 203	+	—	—

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

## 4.11 DIMENSIONS (Continued)

### Flanged Adapter Nipple

**No. 41** ANSI Class 125

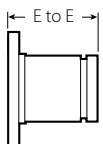
**No. 45F** ANSI Class 150 Flat Face

**No. 45R** ANSI Class 150 Raised Face

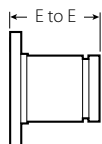
**No. 46F** ANSI Class 300 Flat Face

**No. 46R** ANSI Class 300 Raised Face

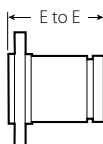
**No. 45RE** PN10/PN16 Raised Face



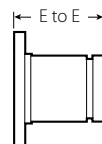
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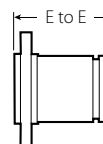
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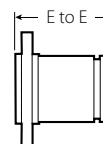
No. 45R




No. 46F



No. 46R



No. 45RE

Size		No. 41 ANSI 125 Flange Adapter Nipple		No. 45F and No. 45R ANSI 150 Flanged Adapter Nipple (s)		No. 46F and No. 46R ANSI 300 Flanged Adapter Nipple (s)		No. 45RE Flanged Adapter Nipple (s)	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
20 <sup>2</sup> DN500	20.000 508.0	8.00 203	—	8.00 203	+	8.00 203	+	—	—
24 <sup>2</sup> DN600	24.000 610.0	8.00 203	—	8.00 203	+	8.00 203	+	—	—
14 – 60 DN350 – DN1500	For AGS fitting information, see <a href="#">publication 20.05</a> 								

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details

#### NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

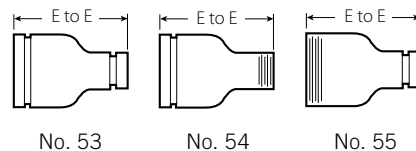
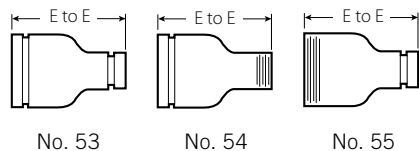
## 4.12 DIMENSIONS

### Swaged Nipple

No. 53 Grv. x Grv.

No. 54 Grv. x Thd.

No. 55 Thd. x Grv.



Size			No. 53, 54, and 55 Swaged Nipples (s)	
Nominal inches DN			E to E inches mm	Approx. Weight (Each) lb kg
2 DN50	x	1 DN25	6.50 165	2.0 0.9
		1¼ DN32	6.50 165	2.0 0.9
		1½ DN40	6.50 165	2.0 0.9
2½	x	1 DN25	7.00 178	3.0 1.4
		1¼ DN32	7.00 178	3.0 1.4
		1½ DN40	7.00 178	3.0 1.4
		2 DN50	7.00 178	3.0 1.4
3 DN80	x	1 DN25	8.00 203	4.5 2.0
		1¼ DN32	8.00 203	4.5 2.0
		1½ DN40	8.00 203	4.5 2.0
		2 DN50	8.00 203	4.5 2.0
		2½	8.00 203	4.5 2.0
3½ DN90	x	3 DN80	8.00 203	6.8 3.1
4 DN100	x	1 DN25	9.00 229	7.5 3.4
		1¼ DN32	9.00 229	7.5 3.4
		1½ DN40	9.00 229	7.5 3.4
		2 DN50	9.00 229	7.5 3.4
		2½	9.00 229	7.5 3.4
		3 DN80	9.00 229	7.5 3.4
		3½ DN90	9.00 229	7.5 3.4

Size			No. 53, 54, and 55 Swaged Nipples (s)	
Nominal inches DN			E to E inches mm	Approx. Weight (Each) lb kg
5	x	2 DN50	11.00 279	11.5 5.2
		3 DN80	11.00 279	11.3 5.1
		4 DN100	11.00 279	11.5 5.2
6 DN150	x	1 DN25	12.00 305	17.0 7.7
		1¼ DN32	12.00 305	17.0 7.7
		1½ DN40	12.00 305	17.2 7.8
		2 DN50	12.00 305	17.4 7.9
		2½	12.00 305	17.4 7.9
		3 DN80	12.00 305	17.4 7.9
		3½ DN90	12.00 305	17.4 7.9
		4 DN100	12.00 305	17.5 7.9
		4½	12.00 305	17.5 7.9
		5	12.00 305	17.5 7.9
8 DN200	x	6 DN150	+	20.0 9.1

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details

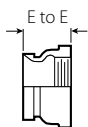
#### NOTE

- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.13 DIMENSIONS

### Female Threaded Adapter

#### No. 80



No. 80

Size		No. 80 Female Threaded Adapter	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	2.00 51	1.0 0.5
1 DN25	1.315 33.7	2.06 52	1.0 0.5
1¼ DN32	1.660 42.4	2.31 (sw) 59	1.5 0.7
1½ DN40	1.900 48.3	2.31 (sw) 59	1.5 0.7
2 DN50	2.375 60.3	2.50 64	1.4 0.6
2½	2.875 73.0	2.75 70	1.5 0.7
3 DN80	3.500 88.9	2.75 70	2.9 1.3
4 DN100	4.500 114.3	3.25 83	4.5 2.0

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

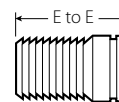
#### NOTES

- Available with British Standard Pipe Threads, specify "BSP" clearly on order.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.14 DIMENSIONS

### Hose Nipple

#### No. 48



No. 48

Size		No. 48 Hose Nipple (s)	
Nominal inches DN	Actual Outside Diameter inches mm	E to E inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	3.12 79	0.3 0.1
1 DN25	1.315 33.7	3.38 86	0.4 0.2
1¼ DN32	1.660 42.4	3.88 98	0.6 0.3
1½ DN40	1.900 48.3	3.88 98	0.8 0.4
2 DN50	2.375 60.3	4.50 114	1.1 0.5
2½	2.875 73.0	5.38 137	2.0 0.9
3 DN80	3.500 88.9	5.75 146	3.2 1.5
4 DN100	4.500 114.3	7.00 178	4.9 2.2
5	5.563 141.3	8.75 222	8.0 3.6
6 DN150	6.625 168.3	10.13 257	14.3 6.5
8 DN200	8.625 219.1	11.88 302	24.7 11.2
10 DN250	10.750 273.0	12.50 318	40.1 18.2
12 DN300	12.750 323.9	14.50 368	62.0 28.1

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTE

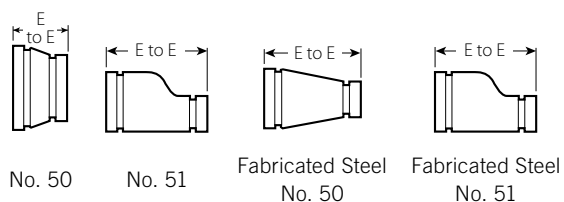
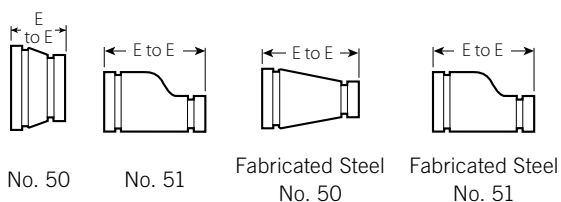
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.15 DIMENSIONS

### Concentric/Eccentric Reducer

No. 50 Concentric

No. 51 Eccentric



Size	No. 50 Concentric Reducer			No. 51 Eccentric Reducer		
Nominal inches DN	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg		
1 1/4 DN32 x 3/4 DN20	+	1.9 0.9	—	—		
1 DN25	+	1.9 0.9	—	—		
1 1/2 DN40 x 3/4 DN20	+	1.4 0.6	—	—		
1 DN25	2.50 64	0.8 0.4	8.50 (sw) 216	4.5 2.0		
1 1/4 DN32	2.50 64	1.0 0.5	—	—		
2 DN50 x 3/4 DN20	2.50 64	0.9 0.3	9.00 (sw) 229	2.0 0.9		
1 DN25	2.50 64	0.7 0.3	9.00 (sw) 229	2.3 1.0		
1 1/4 DN32	2.50 64	1.2 0.5	9.00 (sw) 229	4.6 2.1		
1 1/2 DN40	2.50 64	1.0 0.5	3.50 89	1.1 0.5		
2 1/2 x 3/4 DN20	+	1.3 0.6	+	3.3 1.5		
1 DN25	2.50 64	1.1 0.5	9.50 241	3.5 1.6		
1 1/4 DN32	3.50 89	3.3 1.5	3.50 89	1.4 0.6		
1 1/2 DN40	2.50 64	3.6 1.6	9.50 (sw) 241	3.7 1.7		
2 DN50	2.50 64	3.9 1.8	3.50 89	4.3 2.0		
3 DN80 x 3/4 DN20	+	1.5 0.7	+	4.5 2.0		
1 DN25	2.50 64	1.3 0.6	9.50 (sw) 241	4.8 2.2		
1 1/4 DN32	2.50 64	1.4 0.6	+	4.8 2.2		
1 1/2 DN40	2.50 64	5.1 2.3	9.50 (sw) 241	5.1 2.3		
2 DN50	2.50 64	1.6 0.7	3.50 89	6.0 2.7		
2 1/2	2.50 64	1.8 0.8	3.50 89	7.0 3.2		
DN65	2.50 64	2.1 1.0	—	—		
3 1/2 DN90 x 3 DN80	2.50 64	2.0 0.9	9.50 (sw) 241	7.0 3.2		
4 DN100 x 1 DN25	3.00 76	3.0 1.4	13.00 (sw) 330	6.5 2.9		

Size	No. 50 Concentric Reducer			No. 51 Eccentric Reducer		
Nominal inches DN	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg		
1 1/4 DN32	+	4.6 2.1	—	—		
1 1/2 DN40	3.00 (sw) 76	2.6 1.2	10.00 (sw) 254	8.1 3.7		
2 DN50	3.00 76	2.4 1.1	4.00 102	3.3 1.5		
2 1/2	3.00 76	2.7 1.2	4.00 102	3.4 1.5		
3 DN80	3.00 76	3.2 1.4	4.00 102	3.5 1.6		
3 1/2 DN90	3.00 76	2.9 1.3	10.00 (sw) 254	8.0 3.6		
5 x 2 DN50	11.00 (sw) 279	9.0 4.1	11.00 (sw) 279	5.2 2.4		
2 1/2	4.00 102	4.3 2.0	11.00 (sw) 279	10.8 4.9		
3 DN80	4.00 102	5.5 2.5	11.00 (sw) 279	11.1 5.0		
4 DN100	3.50 89	4.3 1.9	5.00 127	12.0 5.4		
6 DN150 x 1 DN25	4.00 102	5.0 2.3	11.50 (sw) 292	14.5 6.6		
1 1/2 DN40	+	5.5 2.5	+	+		
2 DN50	4.00 102	6.6 3.0	11.50 (sw) 292	14.5 6.6		
2 1/2	4.00 102	6.4 2.9	11.50 (sw) 292	14.2 6.4		
3 DN80	4.00 102	6.4 2.9	5.50 140	15.0 6.8		
4 DN100	4.00 102	6.5 2.9	5.50 140	17.0 7.7		
5	4.00 102	6.4 2.9	5.50 140	17.0 7.7		
8 DN200 x 2 1/2	16.00 406	7.9 3.6	12.00 (sw) 305	26.1 11.8		
3 DN80	5.00 127	9.3 4.2	12.00 (sw) 305	22.0 10.0		
4 DN100	5.00 127	10.4 4.8	12.00 (sw) 305	23.0 10.4		
5	5.00 127	11.6 5.2	12.00 (sw) 305	23.0 10.4		
6 DN150	5.00 127	11.9 5.4	6.00 152	24.0 10.9		

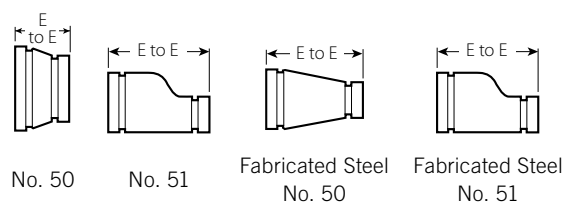
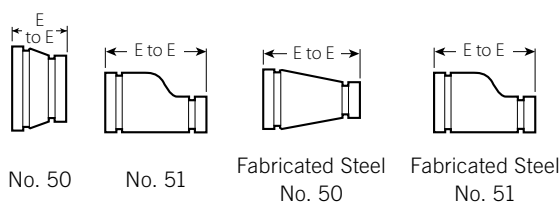


## 4.15 DIMENSIONS (Continued)

### Concentric/Eccentric Reducer

No. 50 Concentric

No. 51 Eccentric



Size		No. 50 Concentric Reducer		No. 51 Eccentric Reducer	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
10 DN250	4 DN100	6.00 152	19.7 8.9	13.00 (sw) 330	32.0 14.5
	5	+	33.0 15.0	+	34.6 15.7
	6 DN150	6.00 152	20.0 9.1	13.00 (sw) 330	36.9 16.7
	8 DN200	6.00 152	22.0 10.0	7.00 178	21.6 9.8
12 DN300	4 DN100	+	44.0 20.0	14.00 (sw) 356	48.0 21.8
	6 DN150	7.00 178	24.6 11.2	14.00 (sw) 356	50.0 22.7
	8 DN200	7.00 178	52.0 23.6	14.00 (sw) 356	53.5 24.3
	10 DN250	7.00 178	39.0 17.7	14.00 (sw) 356	57.0 25.9
14 <sup>2</sup> DN350	6 DN150	13.00 330	65.0 29.5	13.00 330	60.0 27.2
	8 DN200	13.00 330	65.0 29.5	13.00 330	60.0 27.2
	10 DN250	13.00 330	66.0 29.9	13.00 330	65.0 29.5
	12 DN300	13.00 330	68.0 30.8	13.00 330	66.0 29.9
16 <sup>2</sup> DN400	8 DN200	14.00 356	73.0 33.1	14.00 355	73.0 33.1
	10 DN250	14.00 356	73.0 33.1	14.00 355	73.0 33.1
	12 DN300	14.00 356	73.0 33.1	14.00 355	73.0 33.1
	14 DN350	14.00 356	73.0 33.1	14.00 355	73.0 33.1
18 <sup>2</sup> DN450	10 DN250	15.00 381	91.0 41.3	15.00 381	91.0 41.3
	12 DN300	15.00 381	91.0 41.3	15.00 381	91.0 41.3
	14 DN350	15.00 381	91.0 41.3	15.00 381	91.0 41.3
	16 DN400	15.00 381	91.0 41.3	15.00 381	91.0 41.3

<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

Size		No. 50 Concentric Reducer		No. 51 Eccentric Reducer	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg
20 <sup>2</sup> DN500	10 DN250	20.00 508	110.0 49.9	20.00 508	177.0 80.3
	12 DN300	20.00 508	120.0 54.4	20.00 508	120.0 54.4
	14 DN350	20.00 508	149.0 67.9	20.00 508	149.0 67.9
	16 DN400	20.00 508	120.0 54.4	20.00 508	120.0 54.4
	18 DN450	20.00 508	136.0 61.7	20.00 508	136.0 61.7
24 <sup>2</sup> DN600	10 DN250	20.00 508	142.0 64.4	20.00 508	142.0 64.4
	12 DN300	20.00 508	150.0 68.0	20.00 508	150.0 68.0
	14 DN350	20.00 508	162.0 73.5	20.00 508	162.0 73.5
	16 DN400	20.00 508	162.0 73.5	20.00 508	162.0 73.5
	18 DN450	20.00 508	162.0 73.5	20.00 508	162.0 73.5
	20 DN500	20.00 508	151.0 68.5	20.00 508	190.0 86.2
14 – 60 DN350 – DN1500		For AGS fitting information, see <a href="#">publication 20.05</a>			



<sup>2</sup> For 14"/DN350 and larger roll grooved systems, Victaulic offers the Advanced Groove System (AGS). For pricing and availability of cut groove fittings in this size, contact your nearest Victaulic sales representative.

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details.

#### NOTES

- Available with male threaded small end No. 52.
- Cast fitting available for JIS size. Contact Victaulic for details.
- Steel eccentric reducers available through 30"/DN750, contact Victaulic for dimensions.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 4.16 DIMENSIONS

### Small Threaded Reducer

No. 52

No. 52F



No. 52



No. 52F



No. 52



No. 52F

Size		No. 52 Small Threader Reducer		No. 52F Concentric Reducer with BSPT Female Threaded End	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E mm	Approx. Weight (Each) kg
1½ DN40	x 1 DN25	2.50 64	0.8 0.4	—	—
	x 1¼ DN32	2.50 64	0.9 0.4	—	—
2 DN50	x ¾ DN20	2.50 64	0.9 0.4	—	—
	x 1 DN25	2.50 64	0.7 0.3	—	—
	x 1¼ DN32	2.50 64	1.2 0.5	—	—
	x 1½ DN40	2.50 64	1.0 0.5	—	—
	x 2 DN50	2.50 64	1.1 0.5	—	—
2½	x 1 DN25	2.50 64	1.1 0.5	—	—
	x 1¼ DN32	2.50 (sw) 64	1.2 0.5	—	—
	x 1½ DN40	2.50 (sw) 64	1.3 0.6	—	—
	x 2 DN50	2.50 64	1.4 0.6	—	—
DN65	x 1½ DN40	64	0.8	64	0.8
	x 2 DN50	—	—	64	0.9
3 DN80	x ¾ DN20	+(sw)	1.5 0.7	—	—
	x 1 DN25	2.50 64	1.3 0.6	—	—
	x 1¼ DN32	2.50 64	1.5 0.7	—	—
	x 1½ DN40	2.50 (sw) 64	1.5 0.7	—	—
	x 2 DN50	2.50 64	1.5 0.7	—	—
	x 2½ DN60	2.50 64	2.4 1.1	—	—
88.9mm	x 42.4mm	64	0.9	64	0.8
	x 48.3mm	64	0.9	64	0.9
	x 60mm	—	—	64	0.9

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details.

Size		No. 52 Small Threader Reducer		No. 52F Concentric Reducer with BSPT Female Threaded End	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E mm	Approx. Weight (Each) kg
4 DN100	x 1 DN25	3.00 76	2.3 1.0	—	—
	x 1½ DN40	3.00 76	2.7 1.2	—	—
	x 2 DN50	3.00 76	2.6 1.2	—	—
	x 2½ DN60	3.00 76	2.6 1.2	—	—
	x 3 DN80	3.00 76	2.5 1.1	—	—
108.0mm	x 42.4mm	76	1.3	76	1.3
	x 48.3mm	76	1.3	76	1.4
	x 60mm	—	—	76	1.4
114.3mm	x 42.4mm	76	1.3	76	1.3
	x 48.3mm	76	1.3	76	1.3
	x 60mm	76	1.3	76	1.4
5	x 4 DN100	+	4.5 2.0	—	—
133.0mm	x 60mm	—	—	114	2.2
139.0mm	x 60mm	—	—	114	2.3
6 DN150	x 1 DN25	4.00 102	5.5 2.5	—	—
	x 2 DN50	4.00 102	5.7 2.6	—	—
	x 2½ DN60	4.00 102	5.8 2.6	—	—
	x 3 DN80	4.00 102	5.8 2.6	—	—
	x 4 DN100	+(sw)	6.5 2.9	—	—
	x 5 DN125	+(sw)	2.0 0.9	—	—
	x 6 DN150	—	—	—	—
159.0mm	x 42.4mm	114	2.2	144	2.5
	x 48.3mm	114	2.2	114	2.5
	x 60mm	—	—	114	2.6

## 4.16 DIMENSIONS (Continued)

### Small Threaded Reducer

No. 52

No. 52F



No. 52



No 52F

Size		No. 52 Small Threader Reducer		No. 52F Concentric Reducer with BSPT Female Threaded End	
Nominal inches DN		E to E inches mm	Approx. Weight (Each) lb kg	E to E mm	Approx. Weight (Each) kg
165.1mm x 42.4mm		102mm	2.4	102	2.9
	48.3mm	102mm	2.6	102	3.0
	60mm	—	—	102	3.0
8 DN200 x 2 DN50		16.00	1.5	—	—
		406	0.7	—	—
	2 ½	16.00	1.7	—	—
		406	0.8	—	—

(s) = Carbon Steel Direct Roll Groove (OGS)

(sw) = Carbon Steel Segmentally Welded

#### NOTES


- Available with British Standard Pipe Threads, specify "BSP" clearly on order.
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

## 5.0 PERFORMANCE

### Flow Data

#### (Frictional Resistance)

The chart expresses the frictional resistance of various Victaulic fittings as equivalent feet of straight pipe. Fittings not listed can be estimated from the data given, for example, a 22½° elbow is approximately one-half the resistance of a 45° elbow. Values of mid-sizes can be interpolated.

Size		Dimensions					
Nominal inches DN	Actual Outside Diameter inches mm	90° Elbows		45° Elbows		Tees	
		No. 10 Std. Radius feet meters	No. 100 1 ½ D Long Radius feet meters	No. 11 Std. Radius feet meters	No. 110 1 ½ D Long Radius feet meters	Branch feet meters	Run feet meters
1 DN25	1.315 33.7	1.7 0.5	—	0.8 0.2	—	4.2 1.3	1.7 0.5
2 DN50	2.375 60.3	3.5 1.1	2.5 0.8	1.8 0.5	1.1 0.3	8.5 2.6	3.5 1.1
DN65	3.000 76.1	4.3 1.3	—	2.1 0.7	—	10.8 3.3	4.3 1.3
3 DN80	3.500 88.9	5.0 1.5	3.8 1.2	2.6 0.8	1.6 0.5	13.0 4.0	5.0 1.5
	4.250 108.0	6.4 2.0	—	3.2 0.9	—	15.3 4.7	6.4 2.0
4 DN100	4.500 114.3	6.8 2.1	5.0 1.5	3.4 1.0	2.1 0.6	16.0 4.9	6.8 2.1
	5.250 133.0	8.1 2.5	—	4.1 1.2	—	20.0 6.2	8.1 2.5
DN125	5.500 139.7	8.5 2.6	—	4.2 1.3	—	21.0 6.4	8.5 2.6
5	5.563 141.3	8.5 2.6	—	4.2 1.3	—	21.0 6.4	8.5 2.6
	6.250 159.0	9.4 2.9	—	4.9 1.5	—	25.0 7.6	9.6 2.9
	6.500 165.1	9.6 2.9	—	5.0 1.5	—	25.0 7.6	10.0 3.0
6 DN150	6.625 168.3	10.0 3.0	7.5 2.3	5.0 1.5	3.0 0.9	25.0 7.6	10.0 3.0
8 DN200	8.625 219.1	13.0 4.0	9.8 3.0	6.5 2.0	4.0 1.2	33.0 10.1	13.0 4.0
10 DN250	10.750 273.0	17.0 5.2	12.0 3.7	8.3 2.5	5.0 1.5	41.0 12.5	17.0 5.2
12 DN300	12.750 323.9	20.0 6.1	14.5 4.4	10.0 3.0	6.0 1.8	50.0 15.2	20.0 6.1
14 DN350	14.000 355.6	24.5 <sup>4</sup> 7.5	15.8 4.8	18.5 <sup>4</sup> 5.6	11.0 3.4	70.0 21.3	23.0 7.0
16 DN400	16.000 406.4	28.0 <sup>4</sup> 8.5	18.0 5.5	21.0 <sup>4</sup> 6.4	13.0 4.0	80.0 24.4	27.0 8.2
18 DN450	18.000 457.0	31.0 <sup>4</sup> 9.5	20.0 6.1	23.5 <sup>4</sup> 7.2	14.0 4.3	90.0 27.4	30.0 9.1
20 DN800	20.000 508.0	34.0 <sup>4</sup> 10.4	22.5 6.9	25.5 <sup>4</sup> 7.8	16.0 4.9	100.0 30.5	33.0 10.1
24 DN600	24.000 610.0	42.0 <sup>4</sup> 12.8	27.0 8.2	29.5 <sup>4</sup> 9.0	19.0 5.8	120.0 36.6	40.0 12.2
AGS fittings available up to 60"/DN1500. Contact Victaulic for details.							
							

<sup>4</sup> Fitting flow data for 14-24"/DN350-DN600 size No. 10 and No. 11 Elbows is based on fittings for Style 07 and 77 couplings. For flow data on AGS fittings (No. W10 and No. W11 Elbows), refer to [publication 20.05](#).

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**User Responsibility for Product Selection and Suitability**

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

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**Note**

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

**Installation**

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

**Warranty**

Refer to the Warranty section of the current Price List or contact Victaulic for details.

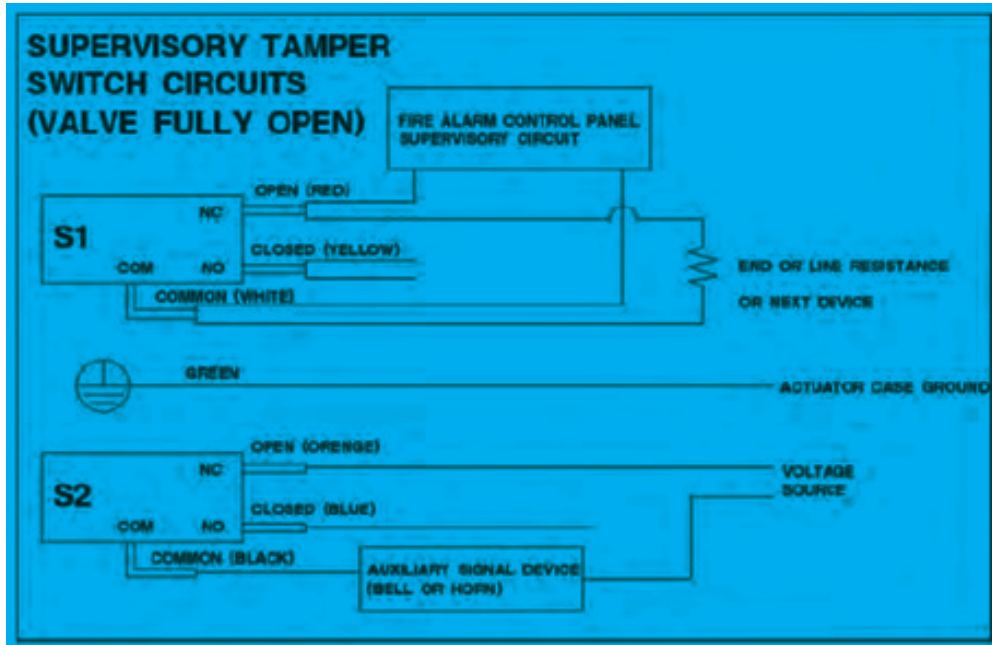
**Trademarks**

*Victaulic* and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.

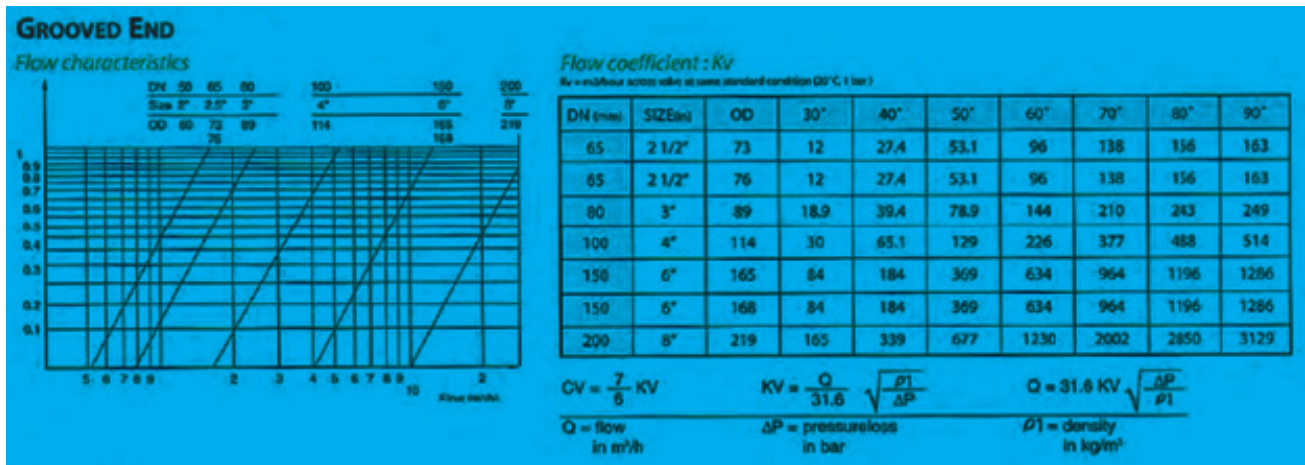




### Wiring Diagram



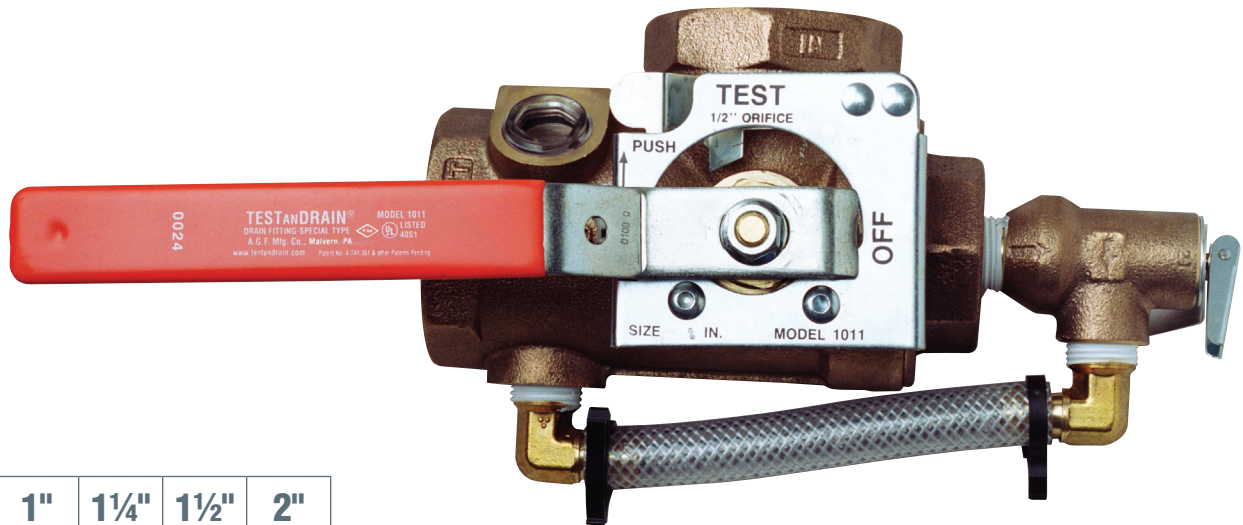
### Test Data





# Model 1011A **TEST<sub>AND</sub>DRAIN<sup>®</sup>**

**Sectional Floor Control Test and Drain Valve  
for Systems Requiring Pressure Relief Valve**



Sizes:

3/4"	1"	1 1/4"	1 1/2"	2"
------	----	--------	--------	----

The AGF **Model 1011A TEST<sub>AND</sub>DRAIN<sup>®</sup>** provides the test and express drain functions for wet fire sprinkler systems on multi-story installations requiring pressure relief (NFPA 13 and NFPA 13R). The **Model 1011A** features a **Model 7000 Pressure Relief Valve** with drain pipe.

The **Model 1011A** is available in a full range of sizes (3/4" to 2") with NPT connections (BSPT available). The **Model 7000 Pressure Relief Valve** (UL/FM) features a flushing handle and a 175 PSI factory rating (other pressure ratings available).

- Complies with NFPA 13 and NFPA 13R Requirements
- Compact, Single-Handle Ball Valve
- Tamper-Resistant Test Orifice and Sight Glasses
- 300 PSI rated.
- Specifiable orifice sizes: 3/8" (2.8K), 7/16" (4.2K), 1/2" (5.6K), 17/32" (8.0K), 5/8" (11.2K, ELO), 3/4" (14.0K, ESFR), and K25
- Relieves Excess System Pressure caused by Surges or Temperature Changes
- Shipped with Relief Valve and Bypass Drain Ports Plugged to Expedite Pressure Testing
- Locking Kit Available

Repair kits are available for all **TEST<sub>AND</sub>DRAIN<sup>®</sup>** valves. Kit includes: Adapter Gasket (1), Ball (1), Valve Seats (2), Stem Packing (1), and Stem Washer (1). *Valve and orifice size must be specified when ordering.*

NOTE: It is important to note that the pressure rating of the relief valve indicates an operating range of pressure for both opening and closing of the valve. Standard relief valves are required to OPEN in a range of pressure between 90% and 105% of their rating. The valves are required to CLOSE at a pressure above 80% of that rating. The relief valve should be installed where it is easily accessible for maintenance. Care should be taken that the relief valve CANNOT be isolated from the system when the system is operational. A relief valve should NEVER have a shutoff valve or a plug downstream of its outlet.

**Reliability, Versatility, Code Compatibility**



# Model 1011A TEST AND DRAIN®

Model 1011A 300 PSI Bronze Ball Valve, Model 7000 Pressure Relief Valve  
Factory Rated at 175 PSI with other setting available

## Dimensions

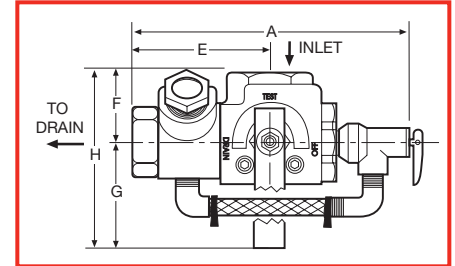
SIZE	A	B	C	D	E	F	G	H
3/4"	7 9/16" (191 mm)	1 1/2" (37.5 mm)	2 3/16" (57 mm)	3 5/8" (93 mm)	3 3/8" (86 mm)	1 13/16" (46 mm)	4 9/16" (117 mm)	6 3/8" (162.5 mm)
1"	7 9/16" (191 mm)	1 1/2" (37.5 mm)	2 3/16" (57 mm)	3 5/8" (93 mm)	3 3/8" (86 mm)	1 13/16" (46 mm)	4 9/16" (117 mm)	6 3/8" (162.5 mm)
1 1/4"	7 15/16" (201 mm)	1 11/16" (43 mm)	2 9/16" (65 mm)	4 1/4" (108 mm)	3 5/8" (91 mm)	1 15/16" (51 mm)	5 9/16" (141 mm)	7 1/2" (192 mm)
1 1/2"	8 15/16" (227 mm)	1 13/16" (45 mm)	3 1/4" (81.5 mm)	5 1/16" (127 mm)	3 7/8" (99 mm)	2 5/8" (67 mm)	8 1/4" (207 mm)	10 7/8" (274 mm)
2"	8 15/16" (227 mm)	1 13/16" (45 mm)	3 1/4" (81.5 mm)	5 1/16" (127 mm)	3 7/8" (99 mm)	2 5/8" (67 mm)	8 1/4" (207 mm)	10 7/8" (274 mm)

## The Model 1011A provides the following...

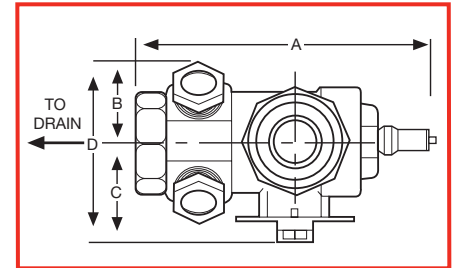
From the 2013 Edition of NFPA 13

- Chapter 8.16.2.4.1\* Provisions shall be made to properly drain all parts of the system.
- Chapter 8.16.2.4.2 Drain connections, interior sectional or floor control valve(s) – shall be provided with a drain connection having a minimum size as shown in Table 8.16.2.4.2.
- Chapter 8.16.2.4.4 Drains shall discharge outside or to a drain capable of handling the flow of the drain.
- Chapter A.8.17.4.2 (Wet Pipe System) test connection is permitted to terminate into a drain capable of accepting full flow... using an approved sight test connection containing a smooth bore corrosion-resistant orifice giving a flow equivalent to one sprinkler...
- Chapter 8.17.4.2.2 The test connection valve shall be accessible.
- Chapter 8.17.4.2.4 shall be permitted to be installed in any location... downstream of the waterflow alarm.
- Chapter 8.17.4.3.1 (Dry Pipe System) a trip test connection not less than 1" in diameter, terminating in a smooth bore corrosion-resistant orifice, to provide a flow equivalent to one sprinkler...
- Chapter 8.17.4.3.2 The trip test connection... with a shutoff valve and plug not less than 1", at least one of which shall be brass.
- Chapter 7.1.2 - a wet pipe system shall be provided with a listed relief valve set to operate at 175 PSI or 10 PSI in excess of the maximum system pressure, whichever is greater.
- Chapter 8.16.1.2.3\* A listed relief valve of not less than 1/2" in size shall be provided on the discharge side of the pressure-reducing valve set to operate at a pressure not exceeding rated pressure of the system.
- Chapter A.8.16.1.2.3 - consideration should be given to piping the discharge from the (pressure relief) valve

## Model 1011A - Front View



## Model 1011A - Plan View



## Orifice Sizes

3/8", 7/16", 1/2", 17/32", 5/8" ELO\*,  
3/4" ESFR\*, and K25\*\*

## Materials

Handle ..... Steel  
Stem ..... Rod Brass  
Ball ..... C.P. Brass  
Body ..... Bronze  
Valve Seat ..... Impregnated Teflon®  
Indicator Plate .... Steel  
Relief Valve ..... Bronze  
Bypass Fittings... Brass  
Bypass Tubing.... Nylobraid

## Approvals

UL and ULC Listed:  
(EX4019 & EX4533)  
FM Approved  
NYC-BSA No. 720-87-SM



## USA Patent # 4741361 and Other Patents Pending



**AGF Manufacturing Inc.**  
100 Quaker Lane, Malvern, PA 19355  
Phone: 610-240-4900  
Fax: 610-240-4906  
www.testandrain.com

Job Name: \_\_\_\_\_  
Architect: \_\_\_\_\_  
Engineer: \_\_\_\_\_  
Contractor: \_\_\_\_\_

\*Available on 1 1/4" to 2" size units only • \*\*Available on 1 1/2" and 2" size units only

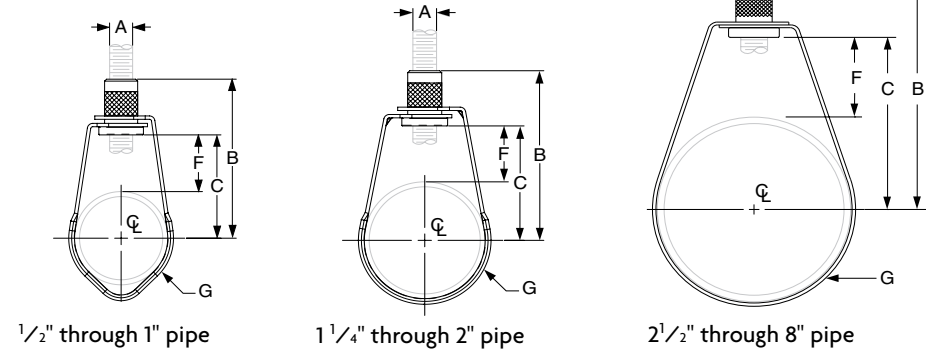
Permit Number: 19-04603

Fig. 69 (Formerly Afcon Fig. 300) Adjustable Swivel Ring, Tapped Per NFPA Standards

**Size Range:** 1/2" through 8"  
**Material:** Carbon steel  
**Finish:** Strap is Pre-Galvanized Zinc Material. Nut is Zinc Plated.  
**Service:** Recommended for suspension of non-insulated **stationary** pipe line.  
**Maximum Temperature:** 450° F  
**Approvals:** Complies with Federal Specification A-A-1192A (Type 10), WW-H-171-E (Type 10), and ANSI/MSS SP-58 (Type 10). UL Listed and FM Approved (Sizes 3/4" - 8").  
**Features:**

- 1/2" - 2" sizes designed for use with steel and CPVC piping and manufactured with FBC System Compatible oil.
- Threads are countersunk so that they cannot become burred or damaged.
- Knurled swivel nut provides vertical adjustment after piping is in place.
- Captured swivel nut in the 1/2" through 6" sizes. The capture is permanent in the bottom portion of the band, allowing the hanger to be opened during installation if desired, but not allowing the nut to fall completely out.

**Ordering:** Specify size, figure number and name.  
**Non-captured nut also available upon request.**



1/2" through 2" Size  
Rounded Edge Design



2 1/2" through 8" Size

FIG. 69: DIMENSIONS (IN) • LOADS (LBS) • WEIGHT (LBS)							
Pipe Size	Max Load	Weight	Rod Size A	B	C	F	G Width
1/2	300	0.10	3/8	2 7/8	2	1 9/16	5/8
3/4		0.10		2 3/4	1 7/8	1 5/16	
1		0.10		2 9/16	1 11/16	1	
1 1/4		0.10		2 5/8	1 3/4	7/8	
1 1/2		0.10		2 3/4	1 7/8	1 1/8	
2	525	0.11	3/4	3 1/4	2 3/8	1 5/16	3/4
2 1/2		0.20		4	2 3/4	1 3/16	
3		0.20		3 13/16	2 15/16	1 9/16	
4	650	0.30	1/2	4 11/16	3 13/16	2 1/4	
5		0.54		5 5/16	4 3/8	3 1/4	
6		0.65		6 11/16	5 9/16	3 1/2	
8	1,000	1.00		8 9/16	7 9/16	3 3/4	

PROJECT INFORMATION		APPROVAL STAMP	
Project:		<input type="checkbox"/> Approved	
Address:		<input type="checkbox"/> Approved as noted	
Contractor:		<input type="checkbox"/> Not approved	
Engineer:		Remarks:	
Submittal Date:			
Notes 1:			
Notes 2:			





**Fig. 58 - Threaded Side Beam Bracket**

**Size Range:** 3/8"-16 rod, pipe sizes 1/2" (15mm) thru 4" (100mm)

**Material:** Pre-Galvanized Steel

**Function:** Practical and economical bracket used to support piping from wood, concrete or steel beams.

**Features:** Unique design allows rod to be easily threaded into bracket. Offset design permits unlimited rod adjustment. Center mounting hole will accept 3/8" and 1/2" fastener bolts. Per NFPA 13: 1/2" (15mm) thru 2" (50mm) pipe requires 3/8" fastener, 2 1/2" (65mm) thru 4" (100mm) pipe requires 1/2" fastener.\*

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL), and Factory Mutual Engineering approved thru 4" (100mm) pipe.

**Finish:** Pre-Galvanized

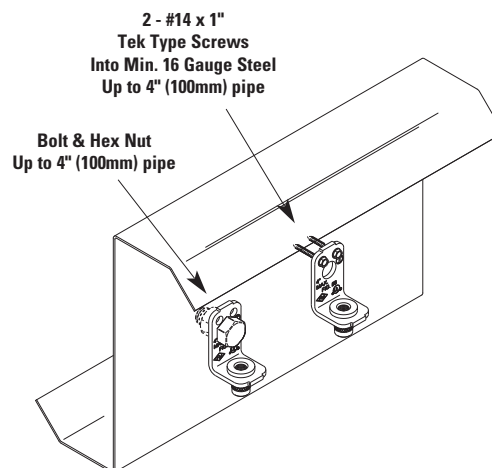
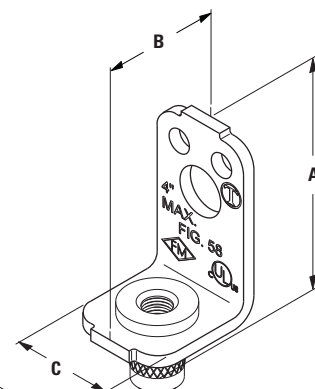
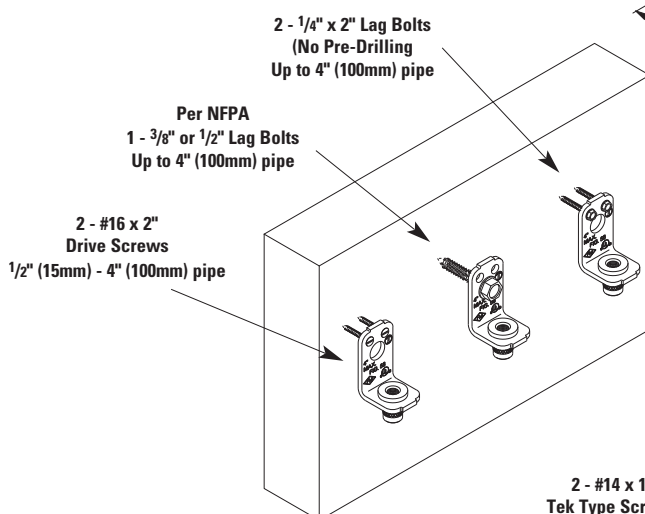
**Order By:** Figure number and finish

**\*Note:** Additionally UL has listed the Fig. 58 with fasteners as shown in table below.

TOLCO

UL  
LISTED

FM  
APPROVED



UL Listed Fastener Table			
Pipe Size	Qty	Fastener Type	Material
2"	2	#16 x 2" Drive screws	Wood
2"	1	3/8" Lag bolt	Wood
2 1/2" - 4"	1	1/2" Lag bolt	Wood
3 1/2"	2	1/4" x 1 1/2" Lag bolts	Wood
4"	2	1/4" x 2" Lag bolts **	Wood
4"	2	1/4" x 1" Tek screws	Metal (15 gauge)
4"	2	1/4" x 1" Tek screws	Metal (16 gauge)

\*\* No pre-drilling

Larger pipe sizes can be hung with reduced spacing.

Part No.	Pipe Size in. (mm)	Rod Size	A in. (mm)	B in. (mm)	C in. (mm)	Approx. Wt./100 Lbs. (kg)
58	1/2" - 4" (15 - 100)	3/8"-16	2 3/4" (69.8)	1 1/2" (38.1)	1 1/8" (28.6)	14 (6.3)

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.





# Seismic Bracing

## Fig. 828 - Universal Sway Brace Attachment to Steel

**Size Range:** One size accommodates all Fig. 900 Series sway brace attachments. Fits from  $\frac{3}{8}$ " (9.4mm) to  $\frac{7}{8}$ " (22.2mm) thick steel structure. For thicknesses less than  $\frac{3}{8}$ " (9.4mm) refer to Fig. 825 and Fig. 825A.

**Material:** Steel

**Function:** To attach sway bracing to various types of steel structural members.

**Features:** Permits secure non-friction connection without drilling or welding. Unique design allows offset placement on wide flange beam, I-beam, C-channel, open web, welded steel trusses, etc.. Secures brace to structure either across or along the beam. Break-off set bolts allow for visual verification of proper installation torque.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). For FM Approval information refer to page 59.

**Installation Instructions:** The Fig. 828 is the structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment to form a complete bracing assembly. NFPA 13 guidelines should be followed.

**To Install:** Place the Fig. 828 on the flange of the beam, truss, or girder. Be sure the attachment is fully engaged to the rear of the opening. Tighten the cone point set bolts (A) until the heads break off. Tighten the cone point set bolt (B) until the head breaks off. Remove the flange nut from set bolt (B). Install a TOLCO swivel fitting (Fig. 980, 910, 909, or any other TOLCO approved transitional fitting). Use flange nut to secure the swivel fitting.

**Finish:** Plain or Electro-Galvanized

**Approx. Weight/100:** 275 Lbs. (124.7kg)

**Order By:** Figure number and finish

Patent #6,098,942, #8,534,625

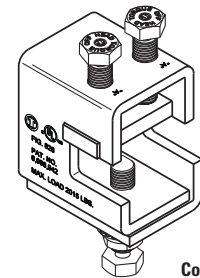
Canada Patent #2,286,659

**Patent Pending**

TOLCO



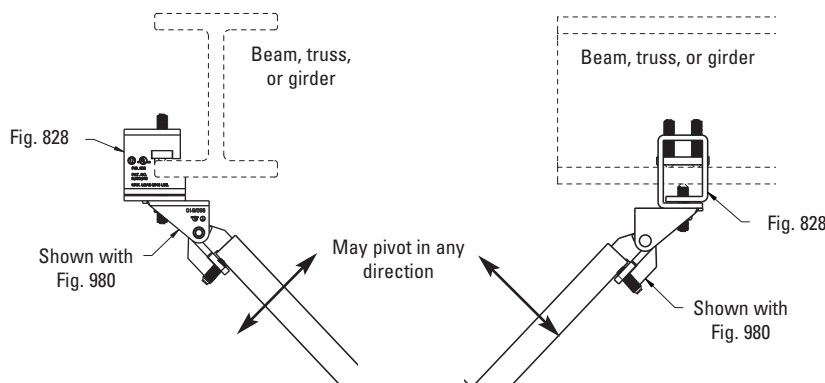
Cone Point  
Set Bolts A



Set Bolts  
Included

Cone Point  
Set Bolt B

UL Horizontal Design Load
Maximum Design Load Across Beam 2015 lbs. (8.96kN)
Maximum Design Load Along Beam 2015 lbs. (8.96kN)



Eaton's B-Line Business seismic bracing components are designed to be compatible only with other B-Line bracing components, resulting in a listed seismic bracing assembly. B-Line's warranty for seismic bracing components will be the warranty provided in B-Line's standard terms and conditions of sale made available by B-Line, except that, in addition to the other exclusions from B-Line's warranty, Eaton's B-Line Business makes no warranty relating to B-Line's seismic bracing components that are combined with products not provided by Eaton's B-Line Business.



# Seismic Bracing

**Fig. 980 - Universal Swivel Sway Brace Attachment - 3/8" to 3/4"**

TOLCO



**Size Range:** One size fits bracing pipe 1" (25mm) thru 2" (50mm), B-Line 12 gauge (2.6mm) channel, and all structural steel up to 1/4" (31.7mm) thick.

**Material:** Steel

**Function:** Multi-functional attachment to structure or braced pipe fitting.

**Features:** This product's design incorporates a concentric attachment opening which is critical to the performance of structural seismic connections. NFPA 13 indicates clearly that fastener table load values are based only on concentric loading. Mounts to any surface angle. Break off bolt head assures verification of proper installation.

**Installation:** Fig.980 is the structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO "braced pipe" attachment, Fig. 1000, 1001, 2002, 4L, 4A or approved attachment to pipe to form a complete bracing assembly. NFPA 13 guidelines should be followed.

**To Install:** Place the Fig. 980 onto the "bracing pipe". Tighten the set bolt until the head breaks off. Attachment can pivot for adjustment to proper brace angle.

**Approvals:** —Underwriters Laboratories Listed in the USA (UL) and Canada (cUL).

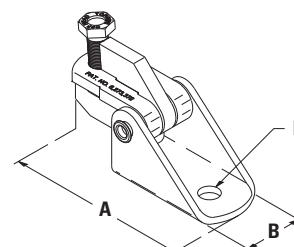
For FM Approval information refer to page 67.

**Note:** Fig. 980 Swivel Attachment and Fig. 1001, 1000, 2002, 4A or approved attachment to pipe that make up a sway brace system of UL Listed attachments and bracing materials which satisfies the requirements of Underwriters Laboratories and the National Fire Protection Association (NFPA)

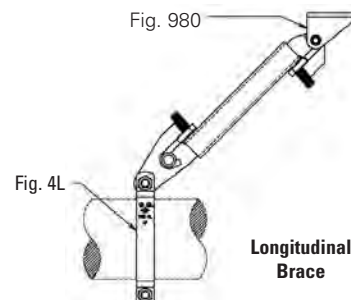
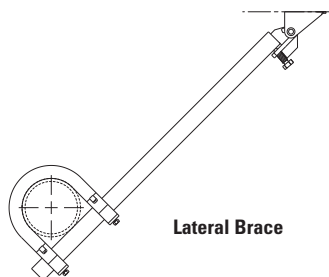
**Finish:** Plain, Electro-Galvanized or Stainless Steel. Contact B-Line for alternative finishes.

**Order By:** Figure number and finish.

**Pat. #6,273,372, Pat. #6,517,030, Pat. #6,953,174,  
Pat. #6,708,930, Pat. #7,191,987, Pat. #7,441,730,  
Pat. #7,669,806**



**Set Bolt  
Included  
Mounting Hardware  
Is Not Included**



Part Number	Mtg. Hdw. Size in. (mm)	A in. (mm)	B in. (mm)	Mounting Hole D in. (mm)	Max. Design Load (cULus) in. (mm)	Approx. Wt./100 lbs. (kg)
980-3/8	3/8" (9.5)	5 1/4" (133.3)	17/8" (47.6)	13/32" (10.3)	2015 (8.96)	149 (67.6)
980-1/2 *	1/2" (12.7)	5 1/4" (133.3)	17/8" (47.6)	17/32" (13.5)	2015 (8.96)	148 (67.1)
980-5/8	5/8" (15.9)	5 1/4" (133.3)	17/8" (47.6)	11/16" (17.5)	2015 (8.96)	147 (66.7)
980-3/4	3/4" (19.0)	5 1/4" (133.3)	17/8" (47.6)	13/16" (20.5)	2015 (8.96)	146 (66.2)

\* Standard size.

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# Seismic Bracing

**Fig. 1001 - Sway Brace Attachment**

**TOLCO**



**Size Range:** Pipe size to be braced: 1" (25mm) thru 8" (200mm) IPS.  
Pipe size used for bracing: 1" (25mm) and 1 1/4" (32mm) Schedule 40 IPS.

**Material:** Steel

**Function:** For bracing pipe against sway and seismic disturbance.  
The pipe attachment component of a sway brace system:  
Fig. 1001 is used in conjunction with a Fig. 900 Series fitting and joined together with bracing pipe per NFPA 13, forming a complete sway brace assembly.

**Features:** Can be used to brace schedules 7 through 40 IPS.  
Field adjustable, making critical pre-engineering of bracing pipe length unnecessary. Unique design requires no threading of bracing pipe. Comes assembled and ready for installation. Fig. 1001 has built-in visual verification of correct installation. See installation note below.

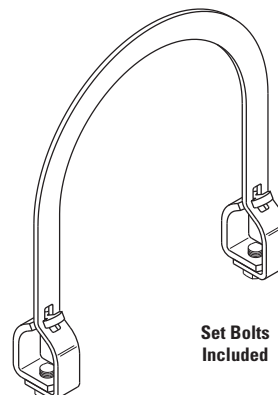
**Installation Note:** Position Fig. 1001 over the pipe to be braced and tighten two hex head cone point set bolts until heads bottom out. A minimum of 1" (25mm) pipe extension is recommended. Brace pipe can be installed on top or bottom of pipe to be braced.

**Approvals:** Underwriters Laboratories Listed in the USA (UL) and Canada (cUL).  
For FM Approval information refer to page 71.

**Finish:** Plain or Electro-Galvanized. Contact B-Line for alternative finishes and materials.

**Order By:** Order by figure number, pipe size to be braced, followed by pipe size used for bracing (1" (25mm) or 1 1/4" (32mm)), and finish.

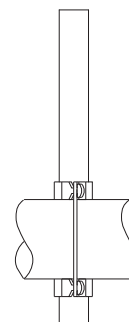
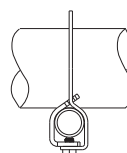
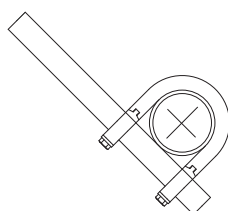
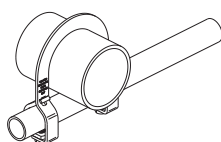
**Important Note:** Fig. 1001 is precision manufactured to perform its function as a critical component of a complete bracing assembly. To ensure performance, the UL Listing requires that Fig. 1001 must be used only with other TOLCO bracing products.



**Set Bolts  
Included**



Pipe Size  in. (mm)	Part Number & Approx. Wt./100				Design Load - Lbs.		
	1" (24mm) Brace Pipe		1 1/4" (32mm) Brace Pipe		For Brace Pipe Size 1" / 1 1/4"		
		Lbs. (kg)		Lbs. (kg)	Sch. 7 1" / 1 1/4"	Sch. 10 1" / 1 1/4"	Sch. 40 1" / 1 1/4"
1" (25)	<b>1001-1 X 1</b>	100.0 (45.3)	<b>1001-1 X 1 1/4</b>	118.0 (53.5)	-- / --	1000 / 1000	1000 / 1000
1 1/4" (32)	<b>1001-1 1/4 X 1</b>	100.0 (45.3)	<b>1001-1 1/4 X 1 1/4</b>	114.0 (51.7)	1000 / 1000	1000 / 1000	1000 / 1000
1 1/2" (40)	<b>1001-1 1/2 X 1</b>	100.0 (45.3)	<b>1001-1 1/2 X 1 1/4</b>	115.0 (52.1)	1000 / 1000	1500 / 1500	1500 / 1500
2" (50)	<b>1001-2 X 1</b>	108.0 (49.0)	<b>1001-2 X 1 1/4</b>	121.0 (54.8)	1000 / 1000	2015 / 2015	2015 / 2015
2 1/2" (65)	<b>1001-2 1/2 X 1</b>	138.6 (62.8)	<b>1001-2 1/2 X 1 1/4</b>	160.4 (72.7)	1600 / 1600	2015 / 2765	2015 / 2765
3" (80)	<b>1001-3 X 1</b>	147.2 (66.7)	<b>1001-3 X 1 1/4</b>	168.7 (76.5)	1600 / 1600	2015 / 2765	2015 / 2765
4" (100)	<b>1001-4 X 1</b>	160.9 (73.0)	<b>1001-4 X 1 1/4</b>	182.4 (82.7)	1600 / 1600	2015 / 2765	2015 / 2765
6" (150)	<b>1001-6 X 1</b>	190.0 (86.2)	<b>1001-6 X 1 1/4</b>	211.4 (95.9)	1600 / 1600	2015 / 2765	2015 / 2765
8" (200)	<b>1001-8 X 1</b>	217.4 (98.6)	<b>1001-8 X 1 1/4</b>	238.8 (108.3)	1600 / 1600	2015 / 2765	2015 / 2765





# Seismic System Attachments

## TOLCO™ Fig. 4LA - "In-Line" Sway Brace Attachment

**Size Range:** 1" (25mm) through 12" (300mm) IPS.

**Material:** Steel

**Function:** For bracing pipe against sway and seismic disturbance.

**Approvals:** Approved by Factory Mutual Engineering (FM), 1" (25mm) through 12" (300mm) pipe. Underwriters Laboratories Listed in the USA and Canada (cULus). Included in our Seismic Engineering Guidelines approved by the State of California Office of Statewide Health Planning and Development (OSHPD). For additional load, spacing and placement information relating to OSHPD projects, please refer to our Seismic Engineering Guidelines, OPM-0052-13. See loads in charts on page 37.

**Installation Instructions:** Fig. 4LA can be used as the system attachment component of a longitudinal or lateral brace assembly. It is intended to be combined with the "bracing member" and our transitional attachment and structural attachment to form a complete bracing assembly. NFPA 13, FM DS 2-8, and/or OSHPD guidelines should be followed.

**To Install:** Place the Fig. 4LA pipe clamp component over the pipe to be braced and tighten down the break-off nuts until the hex head portion breaks off to verify correct installation torque. Next engage brace member (pipe or strut) with jaw component and tighten break-off head bolt until the hex head breaks off to verify correct installation torque. Pivot jaw for correct angle and attach to structure using our brand transitional attachment and structural attachment.

**Finish:** Plain or Electro-Galvanized.

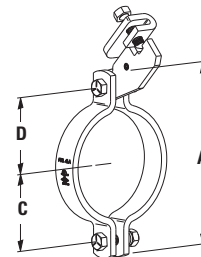
**Order By:** Figure number, pipe size and finish.



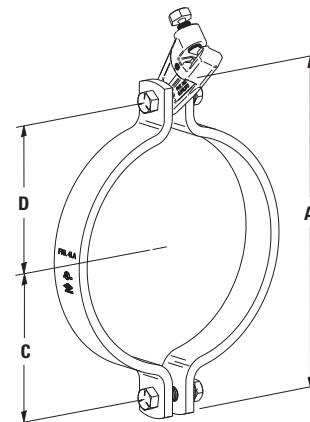
**OPM**



4LA-1 thru 4LA-4



4LA-6 thru 4LA-12



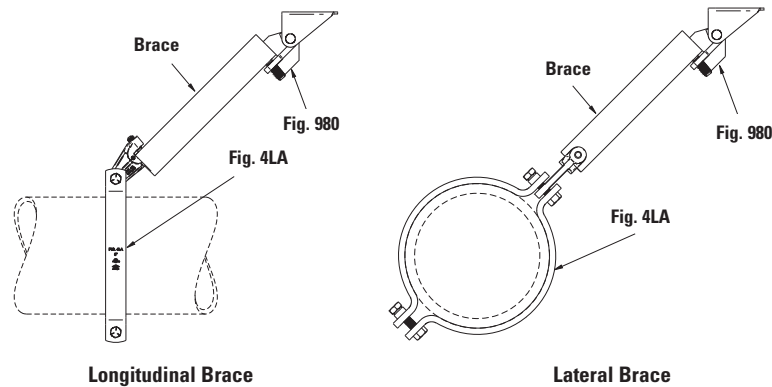
Part No.	Pipe Size		A		C		D		Bolt Size	Approx. Wt./100	
	in.	(mm)	in.	(mm)	in.	(mm)	in.	(mm)		lbs.	(kg)
4LA-1	1"	(25)	3 <sup>19</sup> / <sub>32</sub> "	(91.2)	1 <sup>5</sup> / <sub>16</sub> "	(33.5)	1 <sup>5</sup> / <sub>16</sub> "	(33.5)	3/8"-16	119	(54.0)
4LA-1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub> "	(32)	3 <sup>29</sup> / <sub>32</sub> "	(99.3)	1 <sup>3</sup> / <sub>8</sub> "	(35.3)	1 <sup>3</sup> / <sub>8</sub> "	(35.3)	3/8"-16	123	(55.8)
4LA-1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub> "	(40)	4 <sup>5</sup> / <sub>32</sub> "	(105.7)	1 <sup>1</sup> / <sub>2</sub> "	(38.5)	1 <sup>1</sup> / <sub>2</sub> "	(38.5)	3/8"-16	127	(57.6)
4LA-2	2"	(50)	5 <sup>11</sup> / <sub>32</sub> "	(135.6)	2 <sup>1</sup> / <sub>32</sub> "	(51.9)	2 <sup>1</sup> / <sub>16</sub> "	(51.9)	3/8"-16	142	(64.4)
4LA-2 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub> "	(65)	5 <sup>27</sup> / <sub>32</sub> "	(148.7)	2 <sup>5</sup> / <sub>16</sub> "	(58.5)	2 <sup>5</sup> / <sub>16</sub> "	(58.5)	3/8"-16	173	(78.5)
4LA-3	3"	(80)	6 <sup>1</sup> / <sub>2</sub> "	(164.9)	2 <sup>5</sup> / <sub>8</sub> "	(66.6)	2 <sup>5</sup> / <sub>8</sub> "	(66.6)	3/8"-16	187	(84.8)
4LA-3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub> "	(90)	7 <sup>13</sup> / <sub>32</sub> "	(188.1)	2 <sup>7</sup> / <sub>8</sub> "	(73.1)	2 <sup>7</sup> / <sub>8</sub> "	(73.1)	3/8"-16	198	(89.8)
4LA-4	4"	(100)	7 <sup>17</sup> / <sub>32</sub> "	(191.3)	3 <sup>1</sup> / <sub>8</sub> "	(79.5)	3 <sup>1</sup> / <sub>8</sub> "	(79.5)	3/8"-16	209	(94.8)
4LA-6	6"	(150)	10 <sup>5</sup> / <sub>8</sub> "	(269.9)	4 <sup>9</sup> / <sub>16</sub> "	(115.9)	4 <sup>9</sup> / <sub>16</sub> "	(115.9)	1/2"-13	521	(236.3)
4LA-8	8"	(200)	12 <sup>13</sup> / <sub>16</sub> "	(325.5)	5 <sup>9</sup> / <sub>16</sub> "	(143.7)	5 <sup>21</sup> / <sub>32</sub> "	(143.7)	1/2"-13	629	(285.3)
4LA-10	10"	(250)	16 <sup>1</sup> / <sub>2</sub> "	(419.1)	7 <sup>1</sup> / <sub>4</sub> "	(184.2)	7 <sup>1</sup> / <sub>4</sub> "	(184.2)	1/2"-13	1320	(598.7)
4LA-12	12"	(300)	18 <sup>1</sup> / <sub>2</sub> "	(469.9)	8 <sup>1</sup> / <sub>4</sub> "	(209.6)	8 <sup>1</sup> / <sub>4</sub> "	(209.6)	1/2"-13	1496	(678.6)

Eaton's B-Line series seismic bracing components are designed to be compatible only with other B-Line series bracing components, resulting in a listed seismic bracing assembly. Eaton B-Line Division warranty for seismic bracing components will be the warranty provided in Eaton B-Line Division standard terms and conditions of sale made available by Eaton, except that, in addition to the other exclusions from Eaton B-Line Division warranty, Eaton makes no warranty relating to B-Line series seismic bracing components that are combined with products not provided by Eaton.

All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.



**TOLCO™ Fig. 4LA - “In-Line” Sway Brace Attachment cont.**



Longitudinal Loads		Max. Horizontal Design Load (FM)				Max. Horizontal Design Load (UL)	
Part No.	Pipe Size in. (mm)	30°-44° lbs. (kN)	45°-59° lbs. (kN)	60°-74° lbs. (kN)	75°-90° lbs. (kN)	lbs. (kN)	lbs. (kN)
4LA-1	1" (25)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	1000 (4.45)	
4LA-1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub> " (32)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	1000 (4.45)	
4LA-1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub> " (40)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	1000 (4.45)	
4LA-2	2" (50)	680 (3.02)	860 (3.82)	1030 (4.58)	1150 (5.11)	1000 (4.45)	
4LA-2 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub> " (65)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	1000 (4.45)	
4LA-3	3" (80)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	1000 (4.45)	
4LA-3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub> " (90)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	1000 (4.45)	
4LA-4	4" (100)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	1000 (4.45)	
4LA-6	6" (150)	1620 (7.20)	2,260 (10.05)	2010 (8.94)	2220 (9.87)	1600 (7.11)	
4LA-8	8" (200)	1620 (7.20)	1,660 (7.38)	1570 (6.98)	1740 (7.74)	2015 (8.96)	
4LA-10	10" (250)	1620 (7.20)	1,660 (7.38)	1570 (6.98)	1740 (7.74)	NA	(NA)
4LA-12	12" (300)	1620 (7.20)	1,660 (7.38)	1570 (6.98)	1740 (7.74)	NA	(NA)

Lateral Loads		Max. Horizontal Design Load (FM)				Max. Horizontal Design Load (UL)	
Part No.	Pipe Size in. (mm)	30°-44° lbs. (kN)	45°-59° lbs. (kN)	60°-74° lbs. (kN)	75°-90° lbs. (kN)	lbs. (kN)	lbs. (kN)
4LA-1	1" (25)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	NA	(NA)
4LA-1 <sup>1</sup> / <sub>4</sub>	1 <sup>1</sup> / <sub>4</sub> " (32)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	NA	(NA)
4LA-1 <sup>1</sup> / <sub>2</sub>	1 <sup>1</sup> / <sub>2</sub> " (40)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	NA	(NA)
4LA-2	2" (50)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	NA	(NA)
4LA-2 <sup>1</sup> / <sub>2</sub>	2 <sup>1</sup> / <sub>2</sub> " (65)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	NA	(NA)
4LA-3	3" (80)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	1000 (4.45)	
4LA-3 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>2</sub> " (90)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	1000 (4.45)	
4LA-4	4" (100)	680 (3.02)	970 (4.31)	1190 (5.29)	1320 (5.87)	1000 (4.45)	
4LA-6	6" (150)	1620 (7.20)	2,300 (10.23)	2820 (12.54)	3140 (13.96)	1600 (7.11)	
4LA-8	8" (200)	1620 (7.20)	2,300 (10.23)	2820 (12.54)	3140 (13.96)	2015 (8.96)	
4LA-10	10" (250)	1620 (7.20)	2,300 (10.23)	2820 (12.54)	3140 (13.96)	NA	(NA)
4LA-12	12" (300)	1620 (7.20)	2,300 (10.23)	2820 (12.54)	3140 (13.96)	NA	(NA)

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All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.



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

**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

### 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.

**Important:** This document contains important information on the installation and operation of the VSR 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.

#### General Information

The Model VSR is a vane type waterflow switch for use on wet sprinkler systems. It is UL Listed for use on a steel pipe; schedules 5 through 40, sizes 2" - 6" and 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.

Potter Electric Signal Company, LLC • St. Louis, MO • Phone: 866-956-1211/Canada 888-882-1833 • [www.pottersignal.com](http://www.pottersignal.com)

**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.

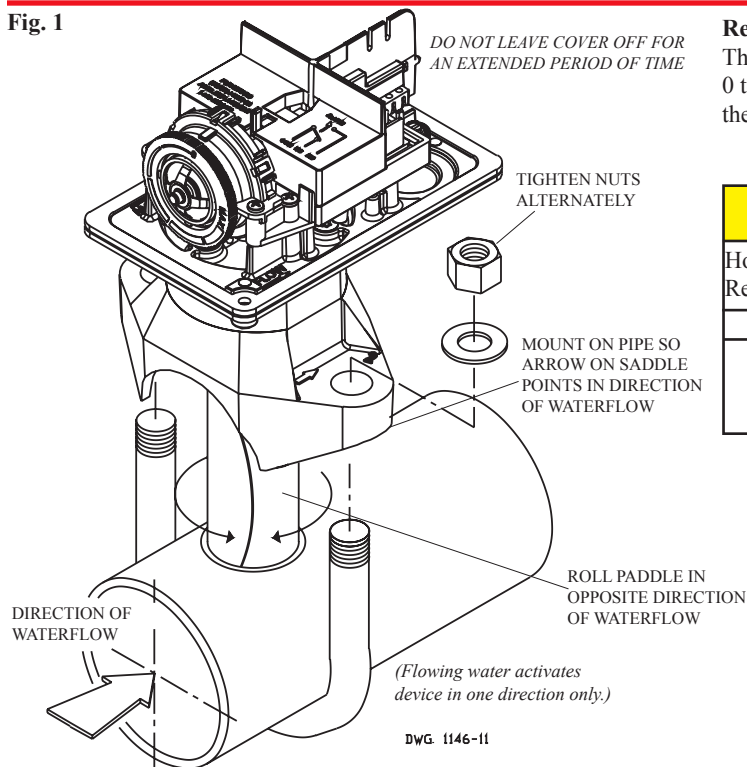
**NOTE:** Do not leave cover off for an extended period of time.

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. 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 qualified technician should disable the alarm system.

**Fig. 1**

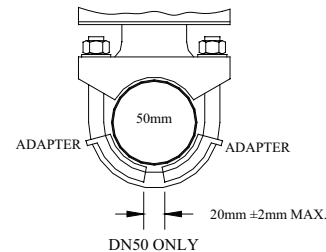
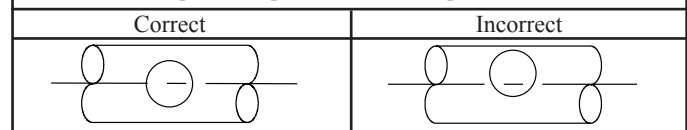


**Retard Adjustment**

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

**CAUTION**

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



USE (2) 5180162 ADAPTERS AS SHOWN ABOVE

DWG# 1146-1F

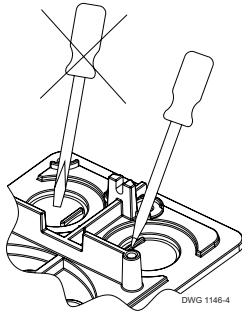
**Compatible Pipe/ Installation Requirements**

Compatible Pipe/ Installation Requirements																		
Model	Nominal Pipe Size		Nominal Pipe O.D.		Pipe Wall Thickness										Hole Size		U-Bolt Nuts Torque	
					Lightwall		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	inch	mm	ft-lb	n-m
VSR-2	2	DN50	2.375	60.3	.065	1.651	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	.084	2.134	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	.083	2.108	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	.084	2.134	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	.115	2.921	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.



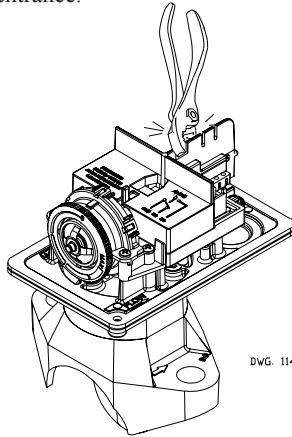
DWG. 1146-4

**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**

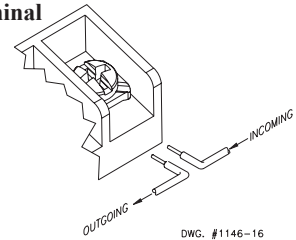
Break out thin section of cover when wiring both switches from one conduit entrance.



DWG. 1146-13

**Fig. 4**

**Switch Terminal Connections Clamping Plate Terminal**



DWG. #1146-16

**WARNING**

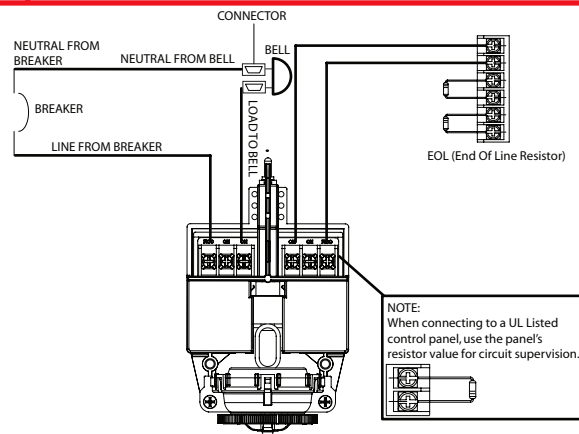
An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render 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. For supervised circuits, see "Switch Terminal Connections" drawing and warning note (Fig. 4).



NOTE:  
When connecting to a UL Listed control panel, use the panel's resistor value for circuit supervision.

**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).

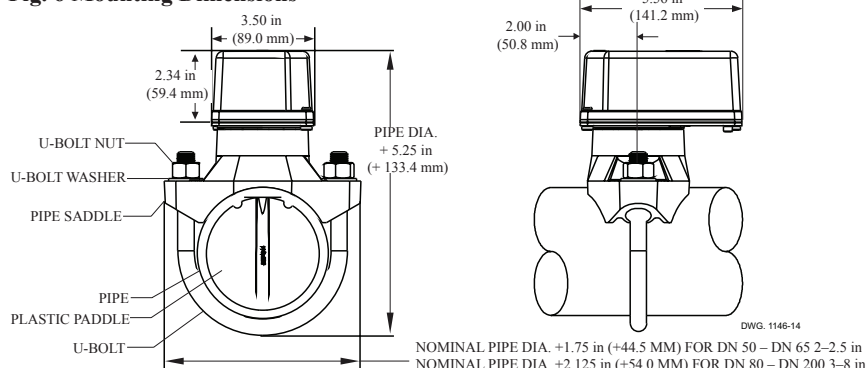
If provided, the inspector's test valve shall always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR is not recommended or advisable.

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.

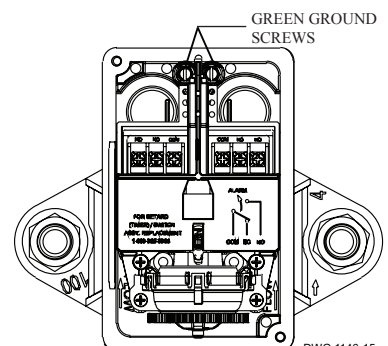
**Fig. 6 Mounting Dimensions**



DWG. 1146-14

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. 7**



DWG. 1146-15

### 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. 8). There is no maintenance required, only periodic testing and inspection.

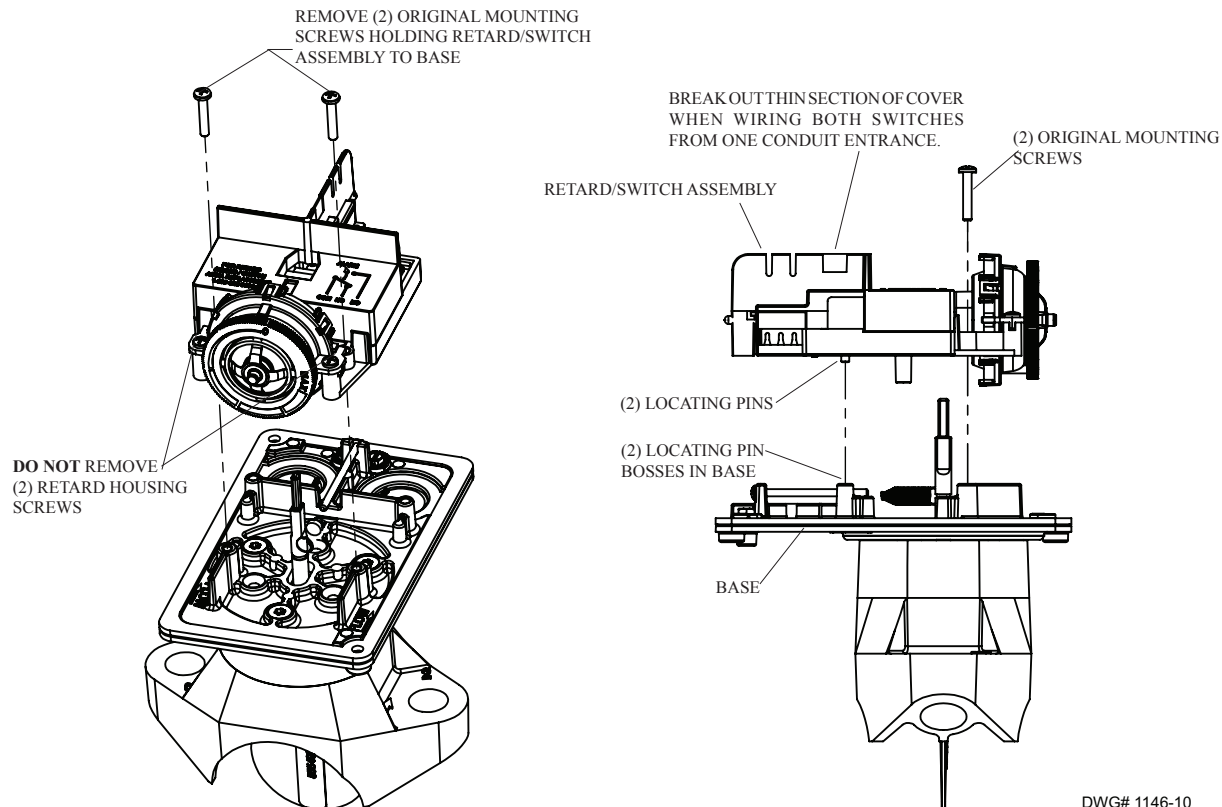
### Retard/Switch Assembly Replacement (See Fig. 8)

#### 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. 8



### 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.