



INTERNATIONAL FIRE PROTECTION INC.

Fire Protection Technical Data Submittal

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Reliable®

Model F1Res Series Glass Bulb Residential Sprinklers

cULus Listed

Features

- cULus Listed Residential Sprinklers
- Available in pendent and horizontal sidewall orientations
- Decorative finishes available, including recessed escutcheons and conical concealed cover plates

Product Description

Model F1Res Series sprinklers are residential sprinklers with a 3 mm glass bulb operating element. A variety of K-Factors as well as recessed and conical concealed options are available as detailed in this Bulletin.

The F1Res Series sprinklers are specially engineered for fast thermal response to meet the requirements of UL 1626. They are intended for installation in accordance with NFPA 13, 13R, and 13D.

Application

The Model F1Res Series sprinklers cULus Listed Residential sprinklers are intended for use in accordance with NFPA 13, NFPA 13R, or NFPA 13D. The Model F1Res residential sprinklers are cULus Listed for use in residential occupancies and residential portions of any occupancy, where permitted by NFPA 13, NFPA 13R, or NFPA 13D. For NFPA 13R and NFPA 13D applications, the design flow and pressure shall not be less than the minimum flow and pressure specified in the Listed Design Criteria tables in this Bulletin. For NFPA 13 applications,

Important Note: Model D wrench and Model GFR2 wrench are no longer compatible with this product. Model W2 (non-recessed) and Model W4 (recessed, concealed) are required.



the design density shall be a minimum of 0.1 gpm/sf (4.1 mm/min), but in no case shall the flow and pressure be less than the minimum flow and pressure specified in the Listed Design Criteria tables in this bulletin. Model F1Res Series sprinklers are listed for use in wet systems only.

Residential Sprinkler Summary

Table A

Sprinkler Model	Sprinkler Identification Number (SIN)	Orientation	K-Factor gpm/psi ^{1/2} (lpm/bar ^{1/2})	Thread Size NPT or ISO7-1	Installation Options	Max. Coverage Area ft x ft (m x m)
F1Res30	R3511	Pendent	3.0 (43)	1/2	Pendent or Recessed	16 x 16 (4.9 x 4.9)
F1Res49	R3516	Pendent	4.9 (71)	1/2	Pendent or Recessed	20 x 20 (6.1 x 6.1)
F1Res58	R3513	Pendent	5.8 (84)	1/2	Pendent or Recessed	20 x 20 (6.1 x 6.1)
F1Res76	R7618	Pendent	7.6 (109)	3/4	Pendent or Recessed	20 x 20 (6.1 x 6.1)
F1Res30 CCP	R3511	Pendent	3.0 (43)	1/2	Conical Concealed	14 x 14 (4.3 x 4.3)
F1Res49 CCP	R3516	Pendent	4.9 (71)	1/2	Conical Concealed	20 x 20 (6.1 x 6.1)
F1Res58 CCP	R3513	Pendent	5.8 (84)	1/2	Conical Concealed	20 x 20 (6.1 x 6.1)
F1Res76 CCP	R7618	Pendent	7.6 (109)	3/4	Conical Concealed	20 x 20 (6.1 x 6.1)
F1Res44 HSW	R3531	Horizontal Sidewall	4.4 (63)	1/2	Recessed	16 x 20 (4.9 x 6.1)
F1Res44 SWC	R3531	Horizontal Sidewall	4.4 (63)	1/2	Conical Concealed	16 x 20 (4.9 x 6.1)
F1Res58 HSW	R3533	Horizontal Sidewall	5.8 (84)	1/2	Recessed	16 x 20 (4.9 x 6.1)
F1Res 58 HSWX	RA3533	Horizontal Sidewall	5.8 (84)	1/2	Recessed	14 x 26 (4.3 x 7.9)

Note: Please note SIN difference between F1Res58 HSW (R3533) and F1Res58 HSWX (RA3533).

Model F1Res30 Residential Pendant Sprinkler & Model F2 Escutcheon

SIN R3511

Technical Specifications

Style: Pendant and Recessed Pendant
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 3.0 (43 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)
 175°F (79°C)

Recessed Escutcheons

F2 Recessed

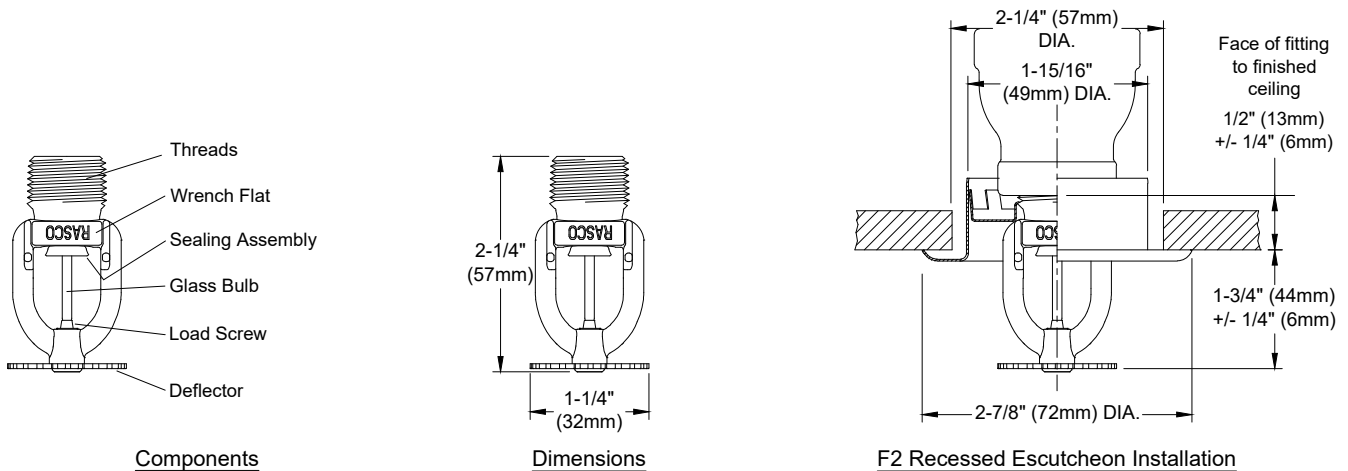
Sprinkler Wrenches

Model W2
 Model W4 (Recessed)



Model F1Res30 Residential Pendant Sprinkler Components and Installation Dimensions

Figure 1



Model F1Res30 Residential Pendant Sprinkler Hydraulic Design Criteria

Table B

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	8 (30)	7.0 (0.48)	1 to 4 inches (25 to 100 mm)
14 x 14 (4.3 x 4.3)	10 (38)	11.0 (0.76)	
15 x 15 (4.6 x 4.6)	12 (45)	16.0 (1.1)	
16 x 16 (4.9 x 4.9)	13 (49)	18.8 (1.3)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

Technical Specifications

Style: Pendent and Recessed Pendent
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 4.9 (71 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass-bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

175°F (79°C)

Recessed Escutcheons

F1 Recessed

F2 Recessed

Sprinkler Wrenches

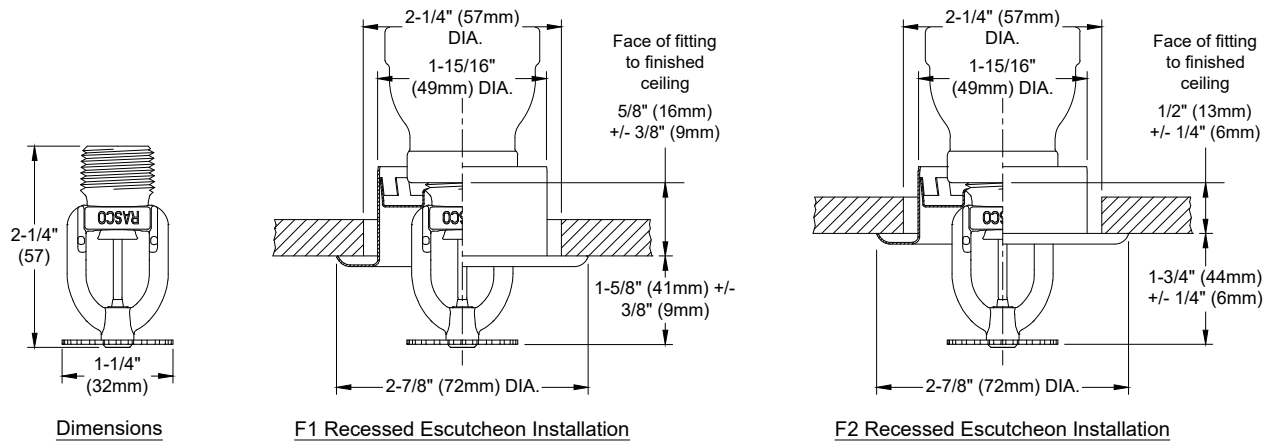
Model W2

Model W4 (Recessed)



Model F1Res49 Residential Pendent Sprinkler Components and Installation Dimensions

Figure 2



Model F1Res49 Residential Pendent Sprinkler Hydraulic Design Criteria

Table C

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	13 (49)	7.0 (0.48)	1 to 4 inches (25 to 100 mm)
14 x 14 (4.3 x 4.3)	13 (49)	7.0 (0.48)	
16 x 16 (4.9 x 4.9)	13 (49)	7.0 (0.48)	
18 x 18 (5.5 x 5.5)	17 (64)	12.0 (0.83)	
20 x 20 (6.1 x 6.1)	20 (76)	16.7 (1.15)	4 to 8 inches (100 to 200 mm)
12 x 12 (3.7 x 3.7)	15 (57)	9.4 (0.65)	
14 x 14 (4.3 x 4.3)	16 (61)	10.7 (0.74)	
16 x 16 (4.9 x 4.9)	17 (64)	12.0 (0.83)	
18 x 18 (5.5 x 5.5)	19 (72)	15.0 (1.03)	
20 x 20 (6.1 x 6.1)	22 (83)	20.2 (1.39)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

Technical Specifications

Style: Pendant and Recessed Pendant
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.8 (84 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

175°F (79°C)

Recessed Escutcheons

F1 Recessed

F2 Recessed

Sprinkler Wrenches

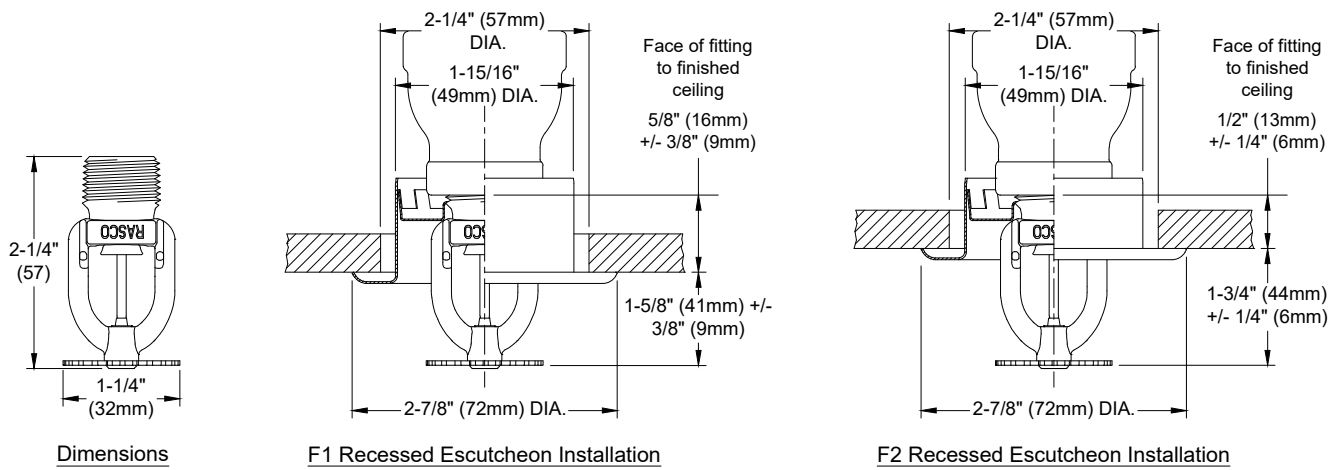
Model W2

Model W4 (Recessed)



Model F1Res58 Residential Pendant Sprinkler Components and Installation Dimensions

Figure 3



Model F1Res58 Residential Pendant Sprinkler Hydraulic Design Criteria

Table D

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
16 x 16 (4.9 x 4.9)	16 (61)	7.6 (0.52)	1 to 4 inches (25 to 100 mm)
18 x 18 (5.5 x 5.5)	19 (72)	10.8 (0.75)	
20 x 20 (6.1 x 6.1)	22 (83)	14.4 (1.0)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

Technical Specifications

Style: Pendant and Recessed Pendant
Threads: 3/4" NPT or ISO7-1R3/4
Nominal K-Factor: 7.6 (109 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)
 175°F (79°C)

Recessed Escutcheons

F1 Recessed
 F2 Recessed

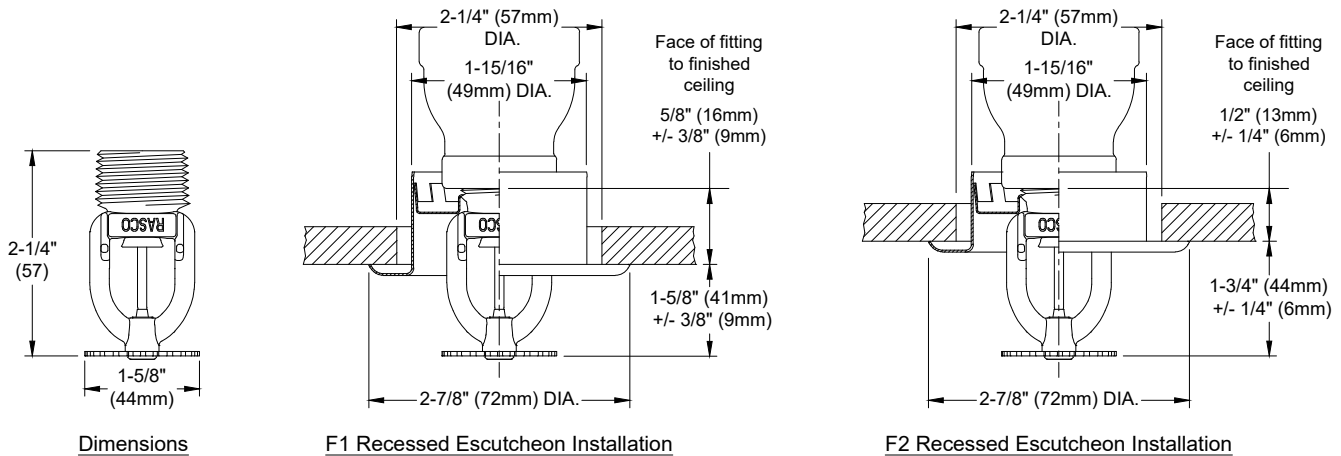
Sprinkler Wrenches

Model W2
 Model W4 (Recessed)



Model F1Res76 Residential Pendant Sprinkler Components and Installation Dimensions

Figure 4



Model F1Res76 Residential Pendant Sprinkler Hydraulic Design Criteria

Table E

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
18 x 18 (5.5 x 5.5)	21 (80)	7.6 (0.52)	1 to 4 inches (25 to 100 mm)
20 x 20 (6.1 x 6.1)	23 (87)	9.2 (0.63)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

Technical Specifications

Style: Conical Concealed Pendant and Recessed Pendant
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 3.0 (43 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

Recessed Escutcheons/Cover Plates

CCP Conical Concealed Plate 135°F (57°C)*
 FP Recessed*

Sprinkler Wrenches

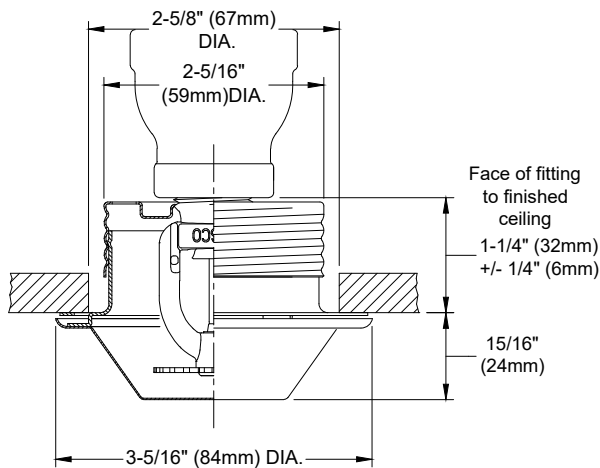
Model W4



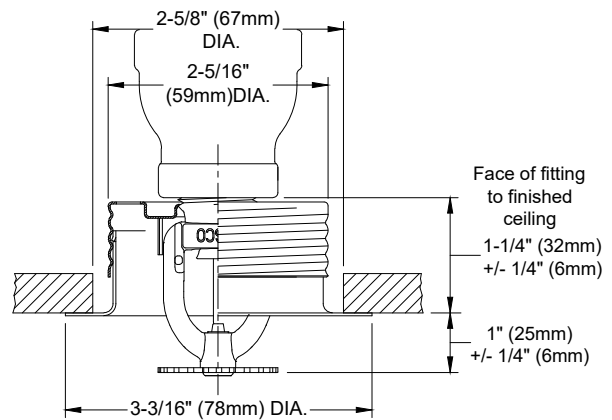
***Note:** Model F1Res sprinklers with Model FP recessed escutcheon or Model CCP cover plate may not be used where the pressure above the ceiling is positive with respect to the protected area. Ensure openings in the sprinkler cup are unobstructed following installation.

Model F1Res30 CCP and FP Recessed Pendant Sprinkler Installation Dimensions

Figure 5



CCP Recessed Escutcheon Installation



FP Recessed Escutcheon Installation

Model F1Res30 CCP Pendant & FP Recessed Pendant Sprinkler Hydraulic Design Criteria

Table F

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	8 (30)	7.0 (0.48)	1/2 to 1 inch (13 to 25 mm)
14 x 14 (4.3 x 4.3)	11 (38)	13.4 (0.92)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- The sprinkler must be installed into a ceiling with the listed cover plate installed.

Technical Specifications

Style: Conical Concealed Pendant and Recessed Pendant
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 4.9 (71 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

Recessed Escutcheons/Cover Plates

CCP Conical Concealed Plate 135°F (57°C)*
 FP Recessed*

Sprinkler Wrenches

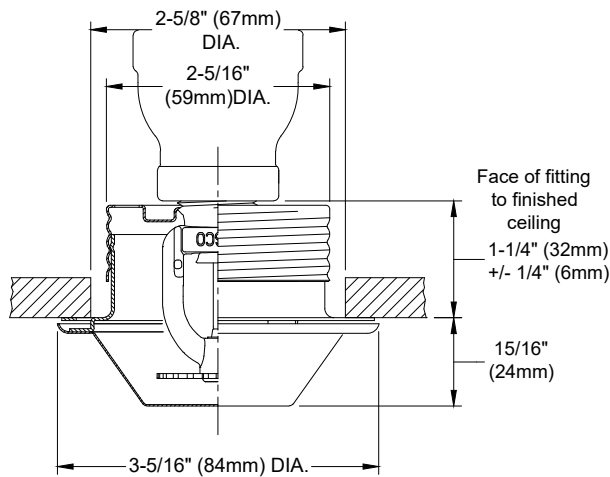
Model W4



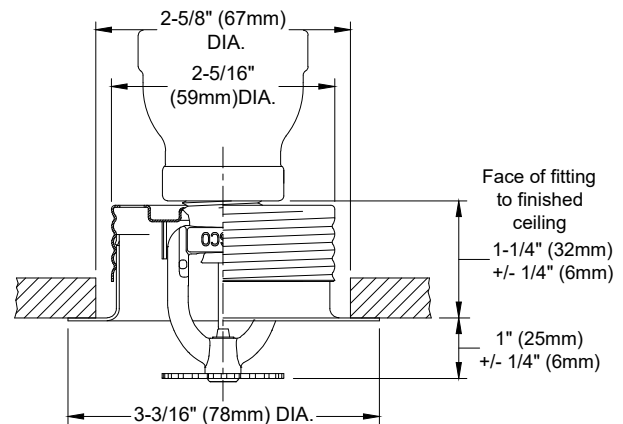
***Note:** Model F1Res sprinklers with Model FP recessed escutcheon or Model CCP cover plate may not be used where the pressure above the ceiling is positive with respect to the protected area. Ensure openings in the sprinkler cup are unobstructed following installation.

Model F1Res49 CCP & FP Recessed Pendant Sprinkler Installation Dimensions

Figure 6



CCP Recessed Escutcheon Installation



FP Recessed Escutcheon Installation

Model F1Res49 CCP Pendant and FP Recessed Pendant Hydraulic Design Criteria

Table G

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
14 x 14 (4.3 x 4.3)	13 (49)	7.0 (0.48)	1/2 to 1 inch (13 to 25 mm)
16 x 16 (4.9 x 4.9)	14 (53)	8.2 (0.57)	
18 x 18 (5.5 x 5.5)	18 (68)	13.5 (0.93)	
20 x 20 (6.1 x 6.1)	20 (76)	16.7 (1.15)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- The sprinkler must be installed into a ceiling with the listed cover plate installed.

Technical Specifications

Style: Conical Concealed Pendent and Recessed Pendent
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.8 (84 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

Recessed Escutcheons/Cover Plates

CCP Conical Concealed Plate 135°F (57°C)*
 FP Recessed*

Sprinkler Wrenches

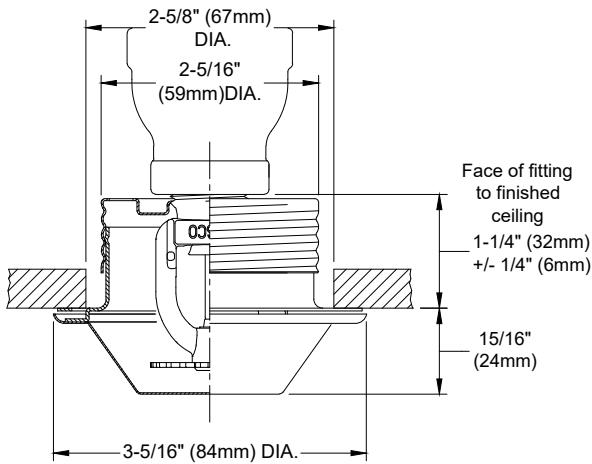
Model W4



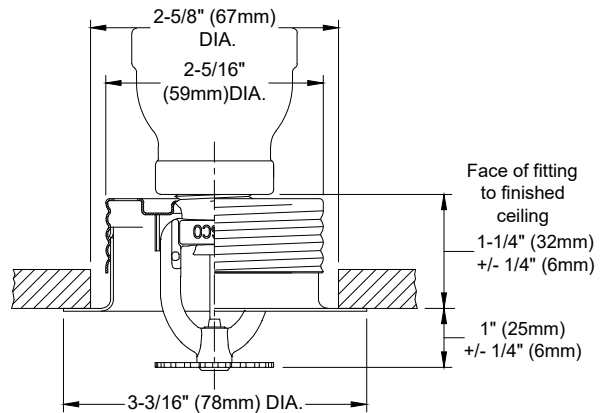
***Note:** Model F1Res sprinklers with Model FP recessed escutcheon or Model CCP cover plate may not be used where the pressure above the ceiling is positive with respect to the protected area. Ensure openings in the sprinkler cup are unobstructed following installation.

Model F1Res58 CCP and FP Recessed Pendent Sprinkler Installation Dimensions

Figure 7



CCP Recessed Escutcheon Installation



FP Recessed Escutcheon Installation

Model F1Res58 CCP Pendent & FP Recessed Pendent Hydraulic Design Criteria

Table H

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
16 x 16 (4.9 x 4.9)	16 (61)	7.6 (0.52)	1/2 to 1 inch (13 to 25 mm)
18 x 18 (5.5 x 5.5)	19 (72)	10.8 (0.75)	
20 x 20 (6.1 x 6.1)	22 (83)	14.4 (1.0)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- The sprinkler must be installed into a ceiling with the listed cover plate installed.

Technical Specifications

Style: Conical Concealed Pendent and Recessed Pendent
Threads: 3/4" NPT or ISO7-1R3/4
Nominal K-Factor: 7.6 (109 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

Recessed Escutcheons/Cover Plates

CCP Conical Concealed Plate 135°F (57°C)*
 FP Recessed*

Sprinkler Wrenches

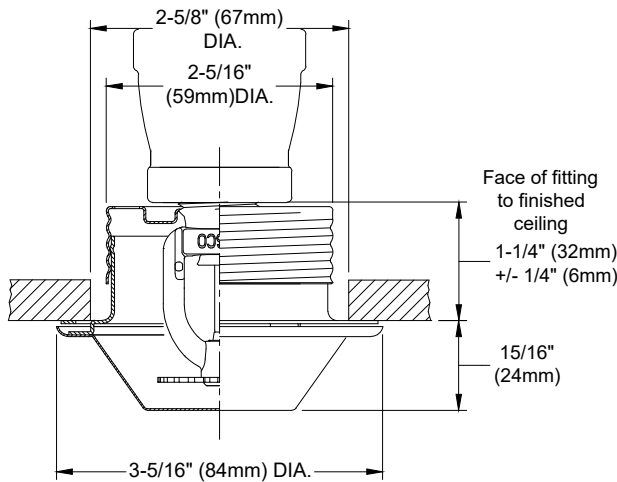
Model W4



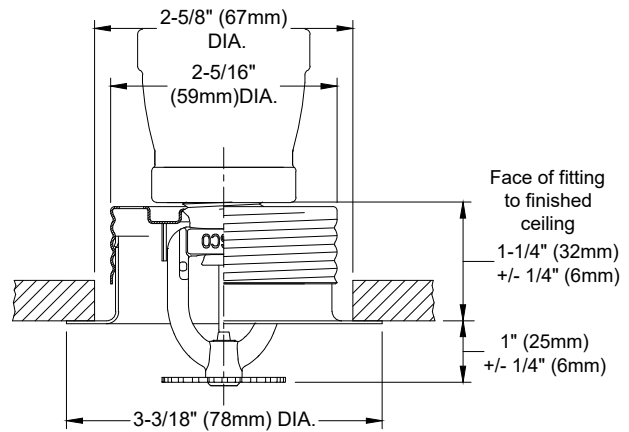
***Note:** Model F1Res sprinklers with Model FP recessed escutcheon or Model CCP cover plate may not be used where the pressure above the ceiling is positive with respect to the protected area. Ensure openings in the sprinkler cup are unobstructed following installation.

Model F1Res76 CCP and FP Recessed Pendent Sprinkler Installation Dimensions

Figure 8



CCP Recessed Escutcheon Installation



FP Recessed Escutcheon Installation

Model F1Res76 CCP Pendent & FP Recessed Pendent Hydraulic Design Criteria

Table I

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
16 x 16 (4.9 x 4.9)	21 (80)	7.6 (0.52)	1/2 to 1 inch (13 to 25 mm)
18 x 18 (5.5 x 5.5)	22 (83)	8.4 (0.58)	
20 x 20 (6.1 x 6.1)	25 (95)	10.8 (0.75)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- The sprinkler must be installed into a ceiling with the listed cover plate installed.

Technical Specifications

Style: Sidewall and Recessed Sidewall
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 4.4 (63 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

175°F (79°C)

Recessed Escutcheons

F2 Recessed

Sprinkler Wrenches

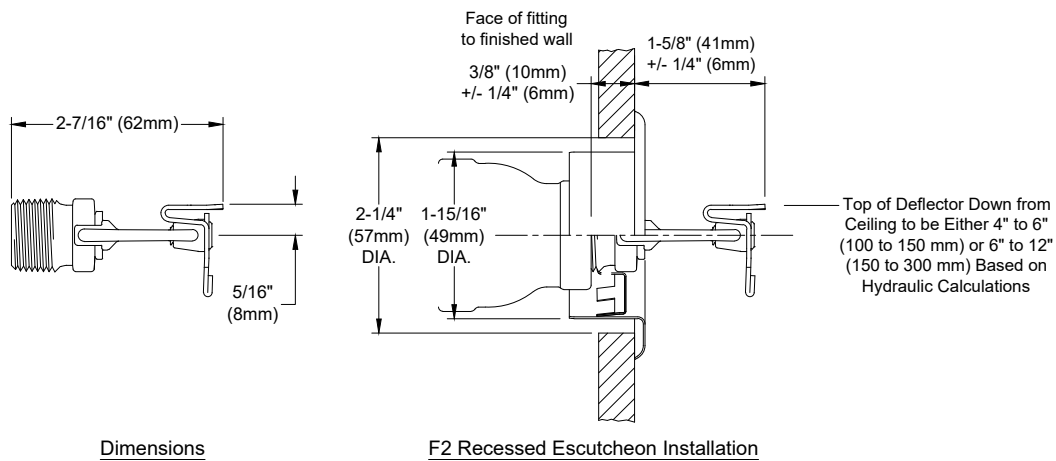
Model W2

Model W4 (Recessed)



Model F1Res44 Horizontal Sidewall Sprinkler Installation Dimensions

Figure 9



Model F1Res44 Horizontal Sidewall Sprinkler Hydraulic Design Criteria

Table J

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	12 (45)	7.5 (0.52)	4 to 6 inches (100 to 150 mm)
14 x 14 (4.3 x 4.3)	14 (53)	10.2 (0.70)	
15 x 15 (4.6 x 4.6)	15 (57)	11.6 (0.80)	
16 x 16 (4.9 x 4.9)	16 (61)	13.3 (0.92)	
16 x 18 (4.9 x 5.5)	18 (68)	16.8 (1.16)	
16 x 20 (4.9 x 6.1)	23 (87)	27.4 (1.89)	
18 x 18 (5.5 x 5.5)	19 (72)	18.7 (1.29)	6 to 12 inches (150 to 300 mm)
12 x 12 (3.7 x 3.7)	14 (53)	10.2 (0.7)	
14 x 14 (4.3 x 4.3)	16 (61)	13.2 (0.91)	
15 x 15 (4.6 x 4.6)	16 (61)	13.2 (0.91)	
16 x 16 (4.9 x 4.9)	17 (64)	15.0 (1.03)	
16 x 18 (4.9 x 5.5)	20 (76)	20.7 (1.43)	
16 x 20 (4.9 x 6.1)	23 (87)	27.4 (1.89)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

Model F1Res44 SWC Conical Concealed Horizontal Sidewall Sprinkler

SIN R3531

Technical Specifications

Style: Conical Concealed Sidewall
Threads: 1/2" NPT or ISO 7-1 R1/2
Nominal K-Factor: 4.4 (63 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass-bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

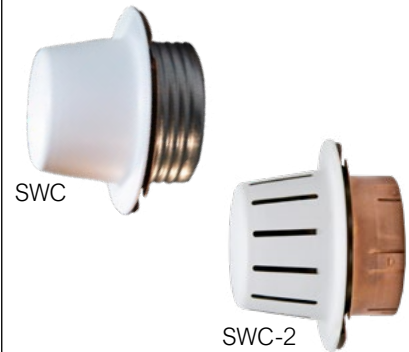
155°F (68°C)
 175°F (79°C) ⁽¹⁾

Cover Plates

SWC Conical Concealed Plate⁽²⁾
 SWC-2 (Slotted) Conical Concealed Plate⁽³⁾

Sprinkler Wrenches

Model W4



Note:

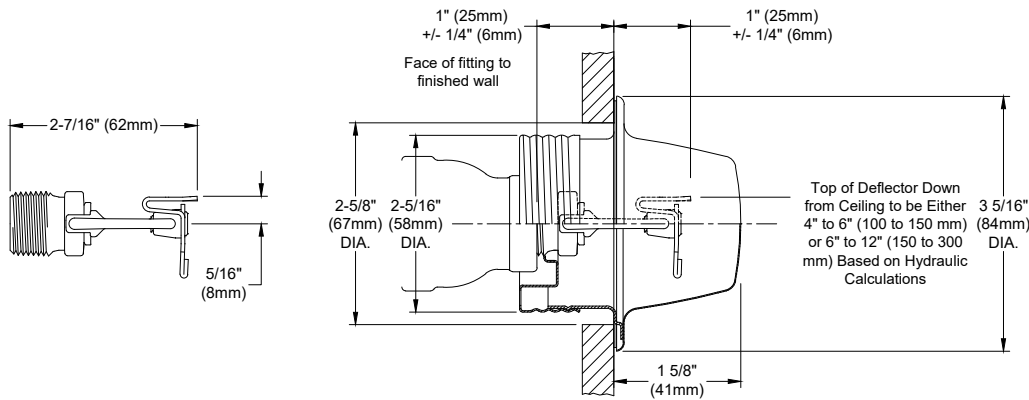
⁽¹⁾ Not for installation where the maximum ceiling temperature exceeds 100°F due to cover plate temperature rating.

⁽²⁾ 135°F SWC Conical Concealed Plate for 155°F (68°C) sprinklers

⁽³⁾ 135°F SWC-2 (Slotted) Conical Concealed Plate for 175°F (79°C) sprinklers

Model F1Res44 SWC Conical Concealed Horizontal Sidewall Sprinkler and Installation Dimensions

Figure 10



Dimensions

SWC & SWC-2 Concealed Cover Plate Installation

Note: Model F1Res44 sprinklers with SWC cover plate may not be used where the pressure behind the sprinkler is positive with respect to the pressure in the protected area. Ensure that openings in the sprinkler cup are unobstructed following installation.

Model F1Res44 SWC Conical Concealed Horizontal Sidewall Sprinkler Hydraulic Design Criteria

Table K

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾					
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Ordinary Temperature Rating 155°F (68°C)		Intermediate Temperature Rating 175°F (79°C)		Deflector to Ceiling Distance
	Flow gpm (l/min)	Pressure psi (bar)	Flow gpm (l/min)	Pressure psi (bar)	
12 x 12 (3.7 x 3.7)	13 (49)	8.7 (0.60)	14 (53)	10.2 (0.7)	4 to 6 inches (100 to 150 mm)
14 x 14 (4.3 x 4.3)	14 (53)	10.2 (0.7)	14 (53)	10.2 (0.7)	
15 x 15 (4.6 x 4.6)	16 (61)	13.2 (0.91)	--	--	
16 x 16 (4.9 x 4.9)	17 (64)	15.0 (1.03)	--	--	
16 x 18 (5.5 x 5.5)	19 (72)	18.7 (1.31)	--	--	
16 x 20 (4.9 x 6.1)	23 (87)	27.4 (1.89)	--	--	6 to 12 inches (150 to 300 mm)
12 x 12 (3.7 x 3.7)	14 (53)	10.2 (0.7)	--	--	
14 x 14 (4.3 x 4.3)	15 (57)	11.7 (0.81)	--	--	
15 x 15 (4.6 x 4.6)	17 (64)	15.0 (1.03)	--	--	
16 x 16 (4.9 x 4.9)	18 (68)	16.8 (1.16)	--	--	
16 x 18 (4.9 x 5.5)	20 (76)	20.7 (1.43)	--	--	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.

Technical Specifications

Style: Sidewall and Recessed Sidewall
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.8 (84 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)

175°F (79°C)

Recessed Escutcheons

F2 Recessed

Sprinkler Wrenches

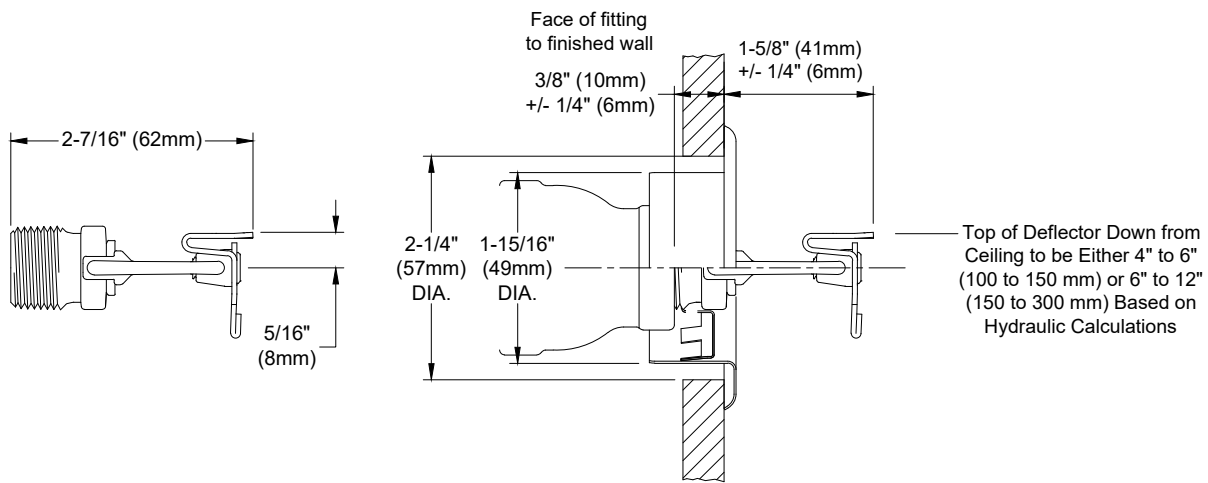
Model W2

Model W4 (Recessed)



Model F1Res58 Residential Horizontal Sidewall Sprinkler Installation Dimensions

Figure 11



Dimensions

F2 Recessed Escutcheon Installation

Model F1Res58 Horizontal Sidewall Sprinkler Hydraulic Design Criteria

Table L

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
12 x 12 (3.7 x 3.7)	16 (61)	7.6 (0.52)	4 to 6 inches (100 to 150 mm)
14 x 14 (4.3 x 4.3)	18 (68)	9.7 (0.66)	
15 x 15 (4.6 x 4.6)	19 (72)	10.7 (0.74)	
16 x 16 (4.9 x 4.9)	21 (80)	13.2 (0.91)	
16 x 18 (4.9 x 5.5)	25 (95)	18.6 (1.28)	
16 x 20 (4.9 x 6.1)	29 (110)	25.0 (1.72)	6 to 12 inches (150 to 300 mm)
12 x 12 (3.7 x 3.7)	22 (83)	14.4 (1.0)	
14 x 14 (4.3 x 4.3)	22 (83)	14.4 (1.0)	
15 x 15 (4.6 x 4.6)	24 (91)	17.1 (1.18)	
16 x 16 (4.9 x 4.9)	26 (98)	20.1 (1.39)	
16 x 18 (4.9 x 5.5)	31 (117)	28.6 (1.97)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- Please note SIN difference between F1Res58 HSW (R3533) and F1Res58 HSWX (RA3533).

Technical Specifications

Style: Sidewall and Recessed Sidewall
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.8 (84 metric)
Max. Working Pressure: 175 psi (12 bar)

Material Specifications

Thermal Sensor: 3 mm glass bulb
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Finishes

(See Table N)

Sensitivity

Fast-response

Temperature Ratings

155°F (68°C)
 175°F (79°C)

Recessed Escutcheons

F2 Recessed

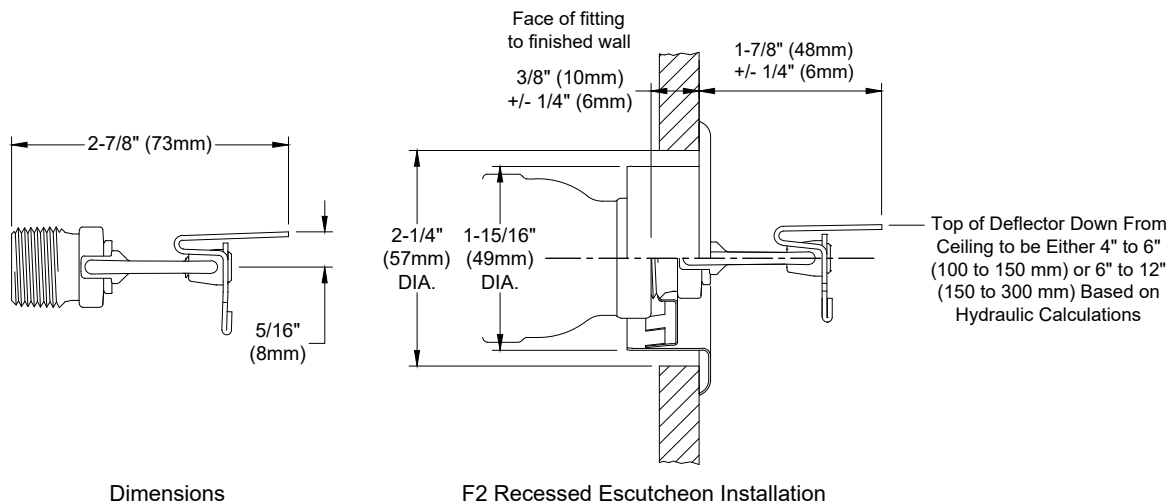
Sprinkler Wrenches

Model W2
 Model W4 (Recessed)



Model F1Res58 HSWX Residential Horizontal Sidewall Sprinkler Installation Dimensions

Figure 12



Model F1Res58 HSWX Horizontal Sidewall Sprinkler Hydraulic Design Criteria

Table M

Minimum Flow and Residual Pressure in Wet Pipe Systems ⁽¹⁾			
Maximum Coverage Area ⁽²⁾ ft. x ft. (m x m)	Flow gpm (l/min)	Pressure psi (bar)	Deflector to Ceiling Distance
18 x 20 (5.5 x 6.1)	30 (114)	26.8 (1.85)	4 to 6 inches (100 to 150 mm)
20 x 20 (6.1 x 6.1)	30 (114)	26.8 (1.85)	
16 x 22 (4.9 x 6.7)	33 (125)	32.4 (2.23)	
16 x 24 (4.9 x 7.3)	38 (144)	42.9 (2.96)	
14 x 26 (4.3 x 7.9)	42 (160)	52.4 (3.63)	6 to 12 inches (150 to 300 mm)
18 x 20 (5.5 x 6.1)	35 (133)	36.4 (2.51)	
16 x 22 (4.9 x 6.7)	38 (144)	42.9 (2.96)	
16 x 24 (4.9 x 7.3)	42 (160)	52.4 (3.61)	
14 x 26 (4.3 x 7.9)	46 (174)	62.9 (4.34)	

Notes:

- For NFPA 13 installations the flow per sprinkler must be the greater of: (1) the flow listed in the table above or (2) the flow required to achieve a minimum design density of 0.1 gpm/sq ft over the design area of the sprinkler.
- For coverage area dimensions less than those listed above, use the minimum required flow for the next larger max. coverage area listed.
- Please note SIN difference between F1Res58 HSW (R3533) and F1Res58 HSWX (RA3533).

Standard Finishes			Special Application Finishes		
Sprinkler ⁽¹⁾	F1, F2, & FP ⁽³⁾ , Escutcheons	CCP, SWC (Conical) Cover Plates ⁽¹⁾	Sprinkler ⁽¹⁾	F1, F2, & FP ⁽³⁾ Escutcheons	CCP, SWC (Conical) Cover Plates ⁽¹⁾
Bronze	Brass	--	Bright Brass	Bright Brass	Bright Brass
Chrome Plated	Chrome Plated	Chrome Plated	Satin Chrome	Satin Chrome	Satin Chrome
White Polyester ⁽²⁾	White Polyester	White Paint	Black Polyester ⁽²⁾	Black Polyester	Black Paint
--	--	--	Custom Color Polyester	Custom Color Polyester	Custom Color Paint
--	--	--	Electroless Nickel PTFE ⁽²⁾	--	--

Notes:

- (1) Paint or any other coating applied over the factory finish will void all approvals and warranties.
- (2) cULus Listed Corrosion Resistant.
- (3) The Model FP escutcheon assembly consists of an unfinished galvanized cup with a finished escutcheon ring.

Installation

Models F1Res sprinklers are to be installed as shown in this bulletin. Model F1, F2, and FP recessed escutcheons are the only recessed escutcheons to be used with Model F1Res sprinklers. Not all F1Res sprinklers may be used with all recessed escutcheons offered. Confirm listing of escutcheon type for use with individual sprinklers. Use of any other recessed escutcheon will void all approvals and warranties.

For installing Model F1Res sprinklers, use only the Model W2 sprinkler Wrench; for installing Models F1Res Recessed Pendant, Sidewall, Conical Concealed Pendant (CCP), and Sidewall Concealed (SWC and SWC-2) sprinklers use only the Model W4 sprinkler wrench. Use of wrenches other than those specified may damage these sprinklers.

Installation of F1Res sprinklers in a wall or ceiling will require a hole diameter of 2-1/4" (57 mm) for F1 or F2 recessed escutcheons; or 2-5/8" (67 mm) for FP recessed escutcheons, CCP, SWC, and SWC-2 cover plates.

Install F1Res HSW sprinklers with a ceiling to deflector distance that complies with the hydraulic design criteria tables in this bulletin. The flow arrow on deflector must point away from near wall and "Top" marking must face the ceiling.

A "leak tight" sprinkler joint can be obtained with the following torque:

- 1/2" NPT and ISO7-1R1/2: 8-18 ft-lbs (11 – 24 N-m)
- 3/4" NPT and ISO7-1R3/4: 14-20 ft-lbs (19 – 27 N-m)

Do not tighten sprinklers over maximum recommended torque. This may cause leakage or impairment of the sprinklers. Do not install any glass bulb sprinklers where the bulb is cracked or there is a loss of liquid from the bulb.

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



Model W2



Model W4

Model W4 Wrench Installation Example

Figure 13



The Model W4 wrench includes two sets of jaws. One set of jaws is equivalent to a Model GFR2 wrench and the other set of jaws is equivalent to a Model W1 wrench. Use the smallest of the two sets of jaws that will fit on the sprinkler's wrench flats. The Model W4 wrench is used in conjunction with the installer's nominal 1/2" square drive ratchet and nominal 5" (125mm) long extension (not provided) as shown in Figure 13.

Maintenance

Reliable Model F1Res Sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, 13, 13D, and 13R, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). Properly installed CCP, SWC, and SWC-2 cover plates will have an air gap that is required for proper operation, do not seal the gap or paint the cover plates.

Replace any sprinkler which has been damaged, where cracks are observed in the glass bulb, or when liquid has been lost from the glass bulb.

A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Listings & Approvals

Listed by Underwriters Laboratories Inc. and UL Certified for Canada (cULus)

Guarantee

For Reliable Automatic Sprinkler Company guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Patents

For patents applicable to products contained in this technical bulletin, please visit www.r-s.co

Ordering Information

Specify the following when ordering:

Sprinkler

- Model (See Table A)
- Temperature Rating
- Threads (NPT or ISO7-1)
- Finish (See Table N)

Escutcheon or Cover Plate

- Model
- Finish (See Table N)

Sprinkler Wrench

- Model W2 (Pendent and HSW)
- W4 (Recessed and Concealed)

Note: Please note SIN difference between F1Res58 HSW (R3533) and F1Res58 HSWX (RA3533).

Reliable®

Model KFR56 Series Sprinklers

Quick-response, Standard Spray Fusible Link Sprinklers

K5.6 (80 metric)
cULus Listed, FM Approved, VdS Approved, CE Certified

Product Description

Model KFR56 series sprinklers are standard spray, quick-response sprinklers with a fusible link operating element. The sprinklers are cULus Listed, FM Approved, VdS Approved, and CE Certified. See Table C for available finishes. All KFR56 sprinklers have a nominal K-factor of 5.6 (80 metric).

Model KFR56 series sprinklers are available in Ordinary (165°F [74°C]) or Intermediate (212°F [100°C]) temperature classification. Model KFR56 Pendant sprinklers are available with Model F1, Model F2, or Model FP recessed escutcheons.

Application

Model KFR56 series sprinklers are listed and approved for installation in accordance with NFPA 13 and FM Loss Prevention Data Sheets. Follow requirements of NFPA 13 for Quick-response Standard Spray Sprinklers when installing Model KFR56 series sprinklers. FM Approvals classifies Model KFR56 sprinklers as K5.6 QR Non-storage and K5.6 QR In-rack Storage sprinklers.

Installation

Model KFR56 series sprinklers must be installed in accordance with the requirements of NFPA 13 or FM Property Loss Prevention Data Sheets. The Model F1, F2, and FP escutcheons are the only recessed escutcheons listed and approved for use with Model KFR56 Pendant sprinklers. The use of any other recessed escutcheon will void all approvals and warranties. Do not install Model FP escutcheons in ceilings that are positively pressurized with respect to the occupied space below.

Use only the Model W2 sprinkler wrench for installing Model KFR56 series pendant, upright, and horizontal sidewall sprinklers, and use the Model W1 or W4 wrench for installing Model KFR56 series recessed pendant, conical concealed pendant (CCP), and recessed horizontal sidewall sprinklers. The use of wrenches other than those specified may damage these sprinklers.

Recommended installation torque is 14-20 ft-lbs (19 – 27 N·m). Do not tighten sprinklers over the maximum recommended torque.



Model KFR56 Pendant



Model KFR56 Upright



Model CCP



Model KFR56 HSW

Exceeding the maximum recommended torque may cause leakage or impairment of the sprinklers.

Listings & Approvals

Listed by Underwriters Laboratories, Inc. and UL Certified for Canada (cULus)

- Sprinklers, Automatic and Open (VNIV)

FM Approved (FM)

- K5.6 QR Non-storage
- K5.6 QR In-rack Storage

VdS Approved and CE Certified to EN12259

UKCA: 0832-UKCA-CPR-S5073, -5074, -5075

Model KFR Series Sprinkler Summary

Table A

Sprinkler Model	Orientation	Listing or Approval	Max. Working Pressure psi (bar)	Sprinkler Identification Number (SIN)
KFR56 Pendant	Pendent	cULus	250 (17.2)	RA3614
		FM, VdS, CE, UKCA	175 (12)	
KFR56 Upright KFR56 Upright Intermediate	Upright	cULus	250 (17.2)	RA3624
		FM, VdS, CE, UKCA	175 (12)	
KFR56 HSW	HSW	cULus	250 (17.2)	RA3634
		FM, VdS, CE, UKCA	175 (12)	

Technical Specifications

Style: Pendent, Recessed Pendent, or Conical
Concealed Pendent

Threads: 1/2" NPT or ISO7-1R1/2

Nominal K-Factor: 5.6 (80 metric)

Max. Working Pressure:
cULus: 250 psi (17.2 bar)
FM, VdS, CE: 175 psi (12 bar)

Material Specifications

Thermal Sensor: Beryllium Nickel

Strut and Lever: Stainless Steel

Roto-clip: Stainless Steel

Sprinkler Frame: Brass Alloy

Cap: Bronze Alloy

Sealing Washer: Nickel with PTFE

Load Screw: Copper Alloy

Deflector: Brass Alloy

Sprinkler Wrenches

Model W2 (non-recessed)

Model W1 or W4 (recessed & concealed)

Model W14 (with guard installed)

Listings and Approvals

cULus Listed

FM Approved

VdS Approved

CE Certificate of constancy of performance

0786-CPR40313

UKCA: 0832-UKCA-CPR-S5074

Sprinkler Finishes

(See Table C)

Sensitivity

Quick-response

Temperature Ratings

165°F (74°C), Gray Link

212°F (100°C), White Link

Recessed Escutcheons/Cover Plates

Model F1 escutcheon (cULus only)

Model F2 escutcheon (cULus, FM)

Model FP escutcheon (cULus only)

Model CCP cover plate (cULus only)

Guards/Water Shields

F-7 Guard (cULus)

F-1 Guard (FM)

F-8 Guard/Water Shield (cULus)

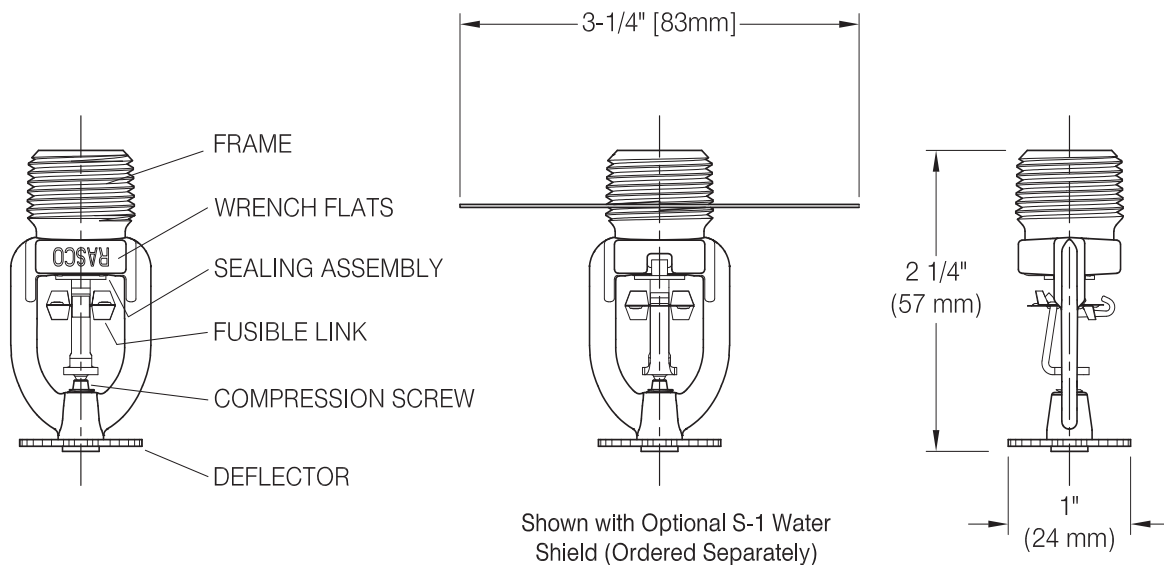
F-5 Guard/Water Shield (FM)

S-1 Water Shield (cULus, FM)



Model KFR56 Pendent Sprinkler Components and Dimensions

Figure 1



Technical Specifications

Style: Upright
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
 cULus: 250 psi (17.2 bar)
 FM, VdS, CE: 175 psi (12 bar)

Material Specifications

Thermal Sensor: Beryllium Nickel
Strut and Lever: Stainless Steel
Roto-clip: Stainless Steel
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Wrench

Model W2
 Model W14 (with guard installed)

Listings and Approvals

cULus Listed
 FM Approved
 VdS Approved
 CE Certificate of constancy of performance
 0786-CPR40314
 UKCA: 0832-UKCA-CPR-S5075

Sprinkler Finishes

(See Table C)

Sensitivity

Quick-response

Temperature Ratings

165°F (74°C), Gray Link
 212°F (100°C), White Link

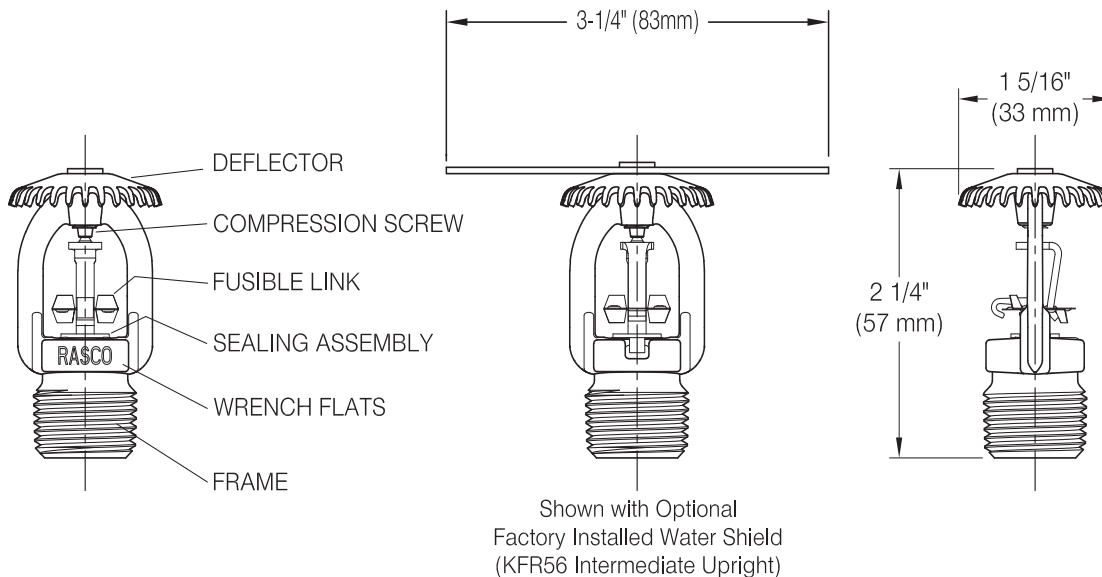
Guards/Water Shields

F-1 Guard (cULus, FM)
 F-3 Guard/Water Shield (cULus, FM)
 Factory Installed Shield (cULus, FM)



Model KFR56 Upright Sprinkler Components and Dimensions

Figure 2



Technical Specifications

Style: HSW or Recessed HSW
Threads: 1/2" NPT or ISO7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure:
 cULus: 250 psi (17.2 bar)
 FM, VdS, CE: 175 psi (12 bar)

Material Specifications

Thermal Sensor: Beryllium Nickel
Strut and Lever: Stainless Steel
Roto-clip: Stainless Steel
Sprinkler Frame: Brass Alloy
Cap: Bronze Alloy
Sealing Washer: Nickel with PTFE
Load Screw: Copper Alloy
Deflector: Brass Alloy

Sprinkler Wrenches

Model W2 (non-recessed)
 Model W1 or W4 (recessed)
 Model W14 (with guard installed)

Listings and Approvals

cULus Listed
 FM Approved
 VdS Approved
 CE Certificate of constancy of performance
 0786-CPR40312
 UKCA: 0832-UKCA-CPR-S5073

Sprinkler Finishes

(See Table C)

Sensitivity

Quick-response

Temperature Ratings

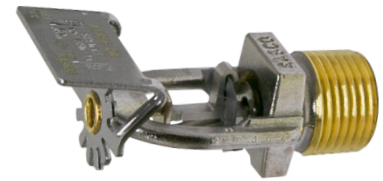
165°F (74°C), Gray Link
 212°F (100°C), White Link

Recessed Escutcheons

Model F1 escutcheon (cULus only)
 Model F2 escutcheon (cULus, FM)
 Model FP escutcheon (cULus only)

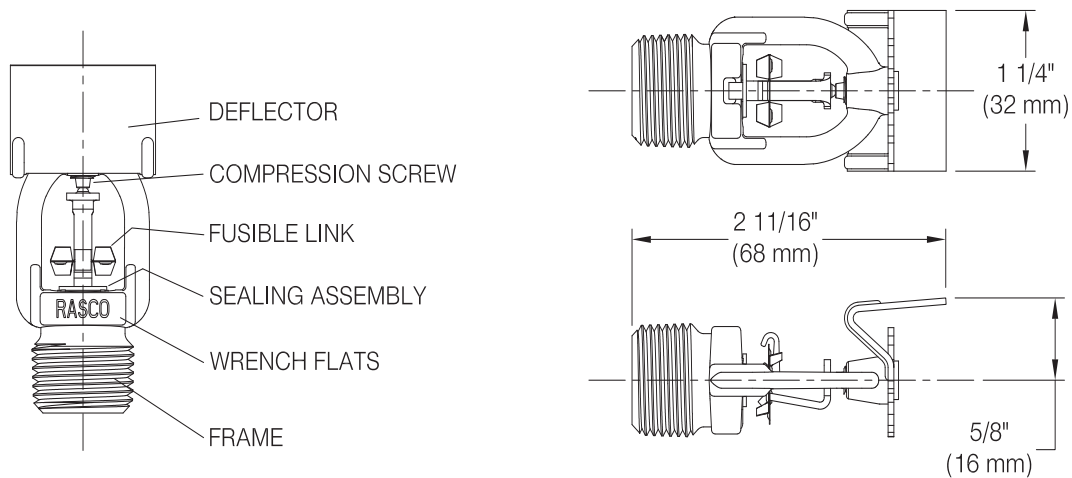
Guards

F-7 Guard (cULus)
 F-4 Guard (FM)



Model KFR56 HSW Sprinkler Components and Dimensions

Figure 3



Recessed Escutcheon and Conical Concealed Cover Plate Dimensions

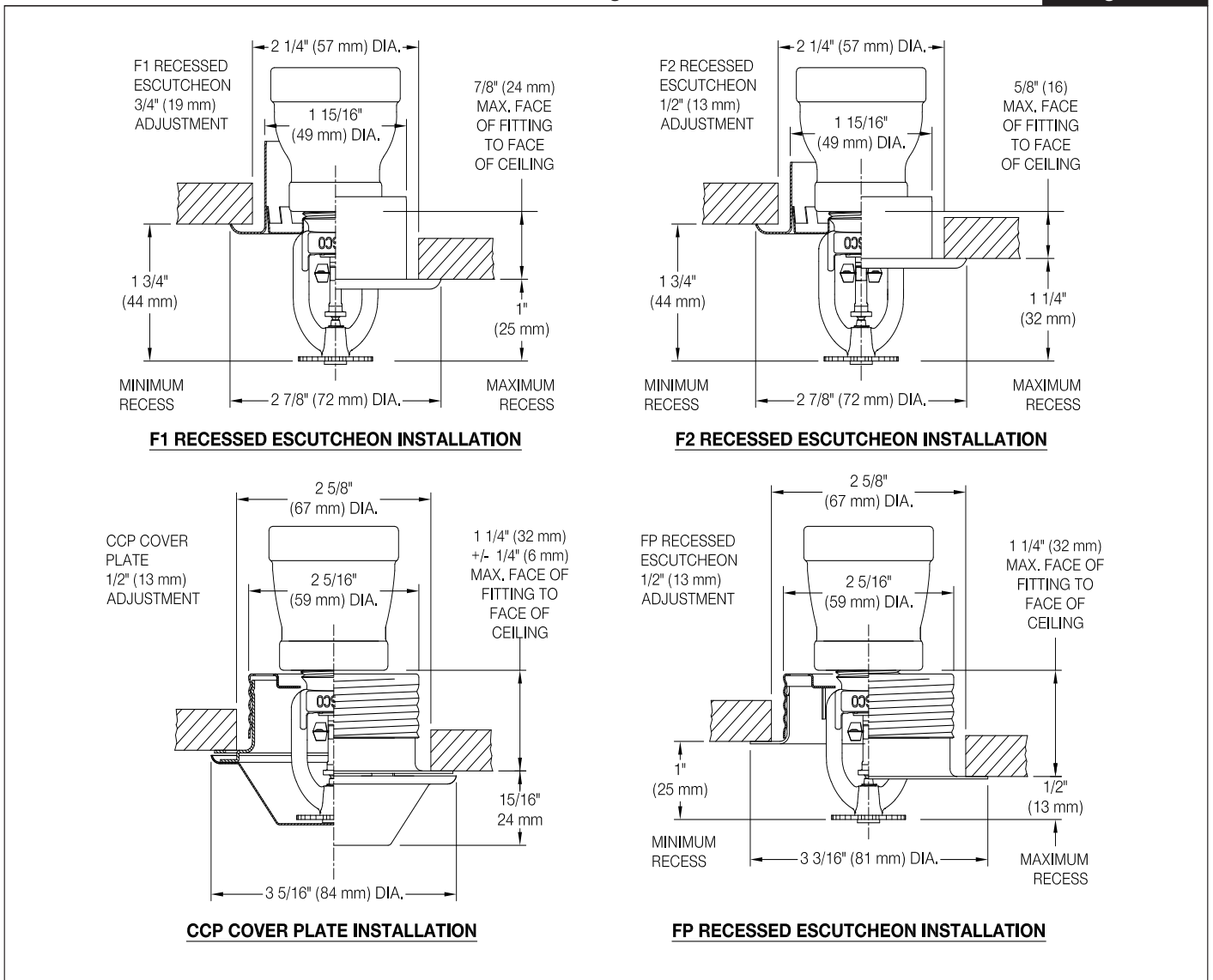
Table B

Type	Adjustment Inch (mm)	Maximum Face of Fitting to Ceiling* Inch (mm)	Minimum Face of Fitting to Ceiling* Inch (mm)	Maximum Deflector Distance Below Ceiling Inch (mm)	Minimum Deflector Distance Below Ceiling Inch (mm)
F1	3/4 (19)	7/8 (24)	1/8 (3)	1-3/4 (44)	1 (25)
F2	1/2 (12)	5/8 (16)	1/8 (3)	1-3/4 (44)	1-1/4 (32)
FP	1/2 (12)	1-1/2 (38)	1 (25)	1 (25)	1/2 (12)
CCP	1/2 (12)	1-1/2 (38)	1 (25)	1 (25)	1/2 (12)

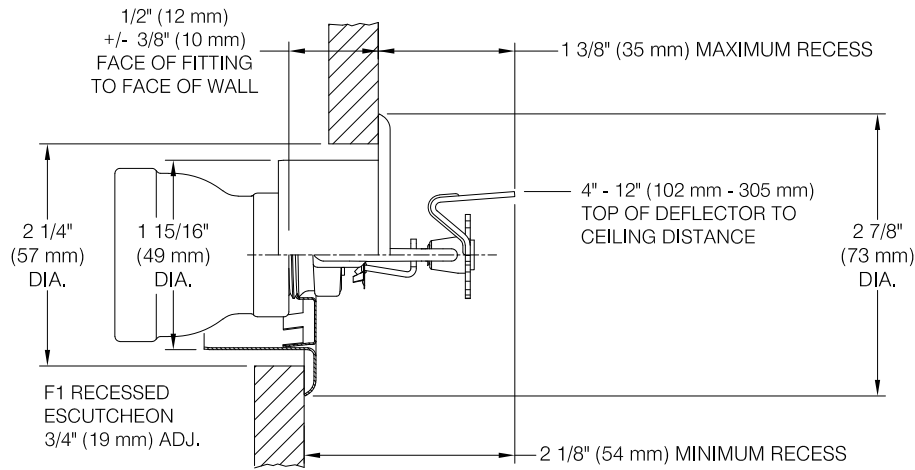
*Note: Face of fitting to ceiling dimensions are based on nominal thread make up. Verify dimensions based on fitting and thread sealing method prior to installation.

Recessed Escutcheon and Conical Concealed Cover Plate Diagrams

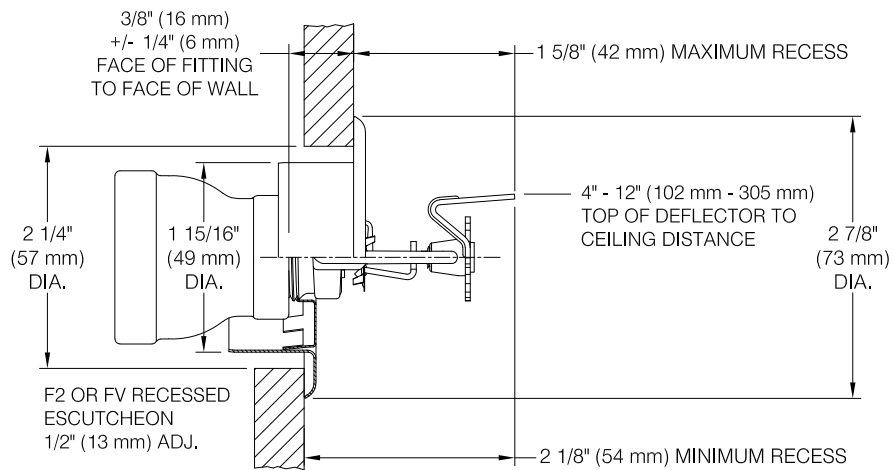
Figure 4



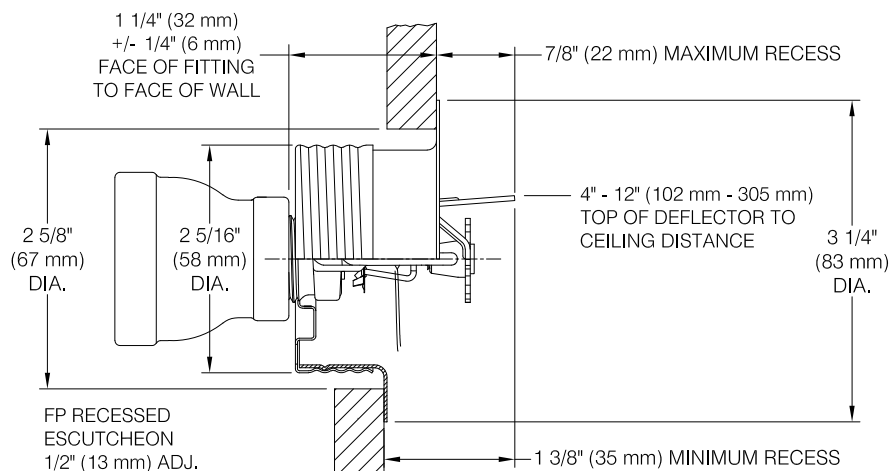
Note: Pendent sprinklers with CCP cover plates or FP recessed escutcheons shall not be installed in locations where the pressure in the ceiling is positive with respect to the pressure below the ceiling. Ensure that the openings in the cup are unobstructed following installation.



F1 RECESSED ESCUTCHEON INSTALLATION



F2 RECESSED ESCUTCHEON INSTALLATION



FP RECESSED ESCUTCHEON INSTALLATION

Note: Sidewall sprinklers with FP recessed escutcheons shall not be installed in locations where the pressure in or behind the wall is positive with respect to the pressure in the protected area. Ensure that the openings in the FP cup are unobstructed following installation.

Sprinkler, Escutcheon, and Cover Plate Finishes⁽¹⁾

Table C

Standard Finishes			Special Application Finishes		
Sprinkler	F1, F2 , and FP ⁽²⁾ Escutcheons	CCP Cover Plate	Sprinkler	F1, F2 , and FP ⁽²⁾ Escutcheons	CCP Cover Plate
Bronze	Brass	--	Bright Brass	Bright Brass	Bright Brass
Chrome Plated	Chrome Plated	Chrome Plated	Satin Chrome	Satin Chrome	Satin Chrome
White Polyester	White Polyester	White Paint	Black Polyester	Black Polyester	Black Paint
			Custom Color Polyester	Custom Color Polyester	Custom Color Paint

Notes:

⁽¹⁾ Paint or any other coating applied over the factory finish will void all approvals and warranties.

⁽²⁾ The Model FP escutcheon assembly consists of an unfinished galvanized cup with a finished escutcheon ring.

Wrench



Maintenance

Reliable Model KFR56 series sprinklers should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

Do not clean sprinklers with soap and water, ammonia liquid or any other cleaning fluids. Remove dust by gentle vacuuming without touching the sprinkler.

Replace any sprinkler which has been painted (other than factory applied). A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers.

Failure to properly maintain sprinklers may result in inadvertent operation or non-operation during a fire event.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering.

Sprinkler

- Model (KFR56 Pendent, KFR56 Upright, KFR56 Upright Intermediate, or KFR56 HSW)
- Temperature Rating [165°F (74°C) or 212°F (100°C)]
- Threads (1/2" NPT or ISO 7-1 R3/4)
- Finish (See Table C)

Escutcheon or Coverplate

- Type (None, F1, F2, FP, or CCP)
- Finish (See Table C)

Guards/Water Shields

- See sprinkler information pages in this bulletin

Sprinkler Wrench

- W2 (Pendent, Upright, & HSW)
- W1 or W4 (Recessed Pendent & HSW, CCP)
- W14 (with guard installed)

Alarm Bell Fig. 02-450



Specifications

Size	Item Number
6" 120VAC	02-452-00
10" 120VAC	02-450-00
6" 24VDC	02-452-50
10" 24VDC	02-450-50

Finish:
Red

Additional Accessories:
ABS Back Box
Wire Bell Cage
911 Bell Sign

Description

The 6" and 10" Alarm Bells provide an audible notification of a sprinkler system event. Can be used to signal flow with in the sprinkler system or tampering with a monitored valve. Each bell is complete and provides 4 wire connectivity for "through" wiring to additional devices. UL Listed. Available in 120VAC or 24VDC.

Installation

Installation of the alarm bell should be performed by a qualified electrician only. Improper installation may cause electrical shock, damage or failure of one or more connected devices.

1. Remove gong.
2. Wire the bell in the circuit according to attached instructions.
3. Mount bell mechanism on 4" square standard outlet box with the striker facing down.
4. Replace gong.
5. The bell must be mounted a minimum of 8ft., above the floor, or, as close to the ceiling as possible.

MAKE SURE SOURCE POWER HAS BEEN DISCONNECTED AND "LOCKED OUT" PRIOR TO INSTALLATION AND CONNECTION OF THE ALARM BELL TO ANY DEVICE. Use with:

Bell Back Box
02-454-00



Bell Guard
02-457-00



Bell Sign
02-057-00



FPPI
An ASC Engineered Solution

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:	

Alarm Bell Installation Instructions



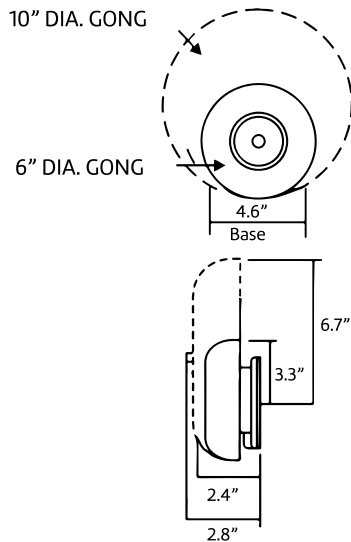
Specifications

Size	Item Number
6" 120VAC	02-452-00
10" 120VAC	02-450-00
6" 24VDC	02-452-50
10" 24VDC	02-450-50

Finish:
Red

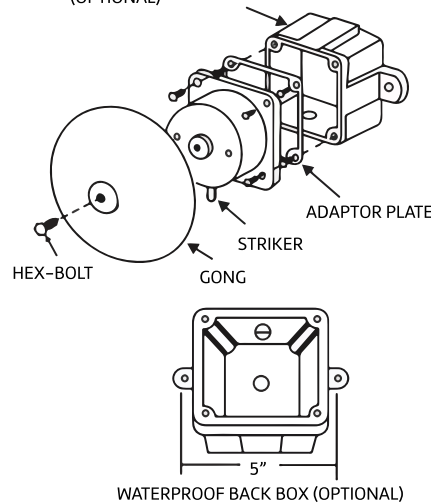
Additional Accessories:
ABS Back Box
Wire Bell Cage
911 Bell Sign

BASIC MECHANISM AND GONGS



SEMI-FLUSH INSTALLATION

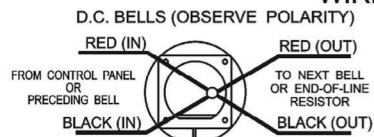
WATERPROOF BACK BOX (FOR OUTDOOR USE)
(OPTIONAL)



AUDIBILITY RATING (dB at 10FT)

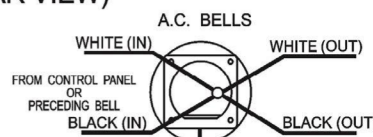
MODEL	6" GONG SIZE			10" GONG SIZE	
	RATING VOLTAGE	RATED CURRENT	SOUND LEVEL AT 10 FT dB	RATED CURRENT	SOUND LEVEL AT 10 FT dB
COIL	6VDC	250mA	95	250mA	95
	12VDC	200mA	96	200mA	96
	24VDC	100mA	96	100mA	96
	120VAC	46mA	98	46mA	98
	220VAC	20mA	97	20mA	97

WIRING (REAR VIEW)



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

- NOTES:**
- 1.OBSERVE POLARITY TO RING D.C. BELLS.
 - 2.RED WIRES POSITIVE (+)
 - 3.BLACK WIRES NEGATIVE (-)



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

- NOTES:**
- 1.WHEN USING A.C. BELLS, TERMINATE EACH EXTRA WIRE SEPARATELY AFTER LAST BELL.

INSTALLATION NOTE

- 1.Remove a gong
- 2.Wire the bell in the circuit.
- 3.Mount bell mechanism on 4" square standard outlet box with the striker facing down.
- 4.Replace a gong
- 5.The bell must be mounted a minimum of 8ft., above the floor, or, as close to the ceiling as possible.
- 6.Polarized bell provides Red(+) and Black(-) lead wires. When you install the bell, observe the polarity.



WFDN Series Waterflow Detector

The System Sensor WFDN series is compatible with schedule 7 through 40 steel pipe, for sizes 2 in. through 4 in. and compatible with schedule 10 through 40 steel pipe, sizes 5 in. through 8 in., and can be mounted in a vertical or horizontal position.

Features

- New directional cover allows installers and inspectors to easily see the direction of flow
- UL-listed models are NEMA 4 rated
- New cover provides a better seal, is lighter weight, not painted and corrosion resistant
- Sealed retard mechanism immune to dust and other contaminants
- Less exposed metal reduces shock hazard, plastic cover acts as insulator and is resistant to arcing
- Visual switch activation
- Audible switch activation (73 dBA)
- Field-replaceable timer/switch assembly
- Accommodates up to 12 AWG wire
- Switch Synchronization activates both alarm panel and local bell or horn strobe
- Tamper-resistant cover screws
- Improved water sealing
- Reduced product weight
- Wire-ready terminals
- Improved wiring with new terminal block layout
- Snap-in optional cover tamper switch
- Improved timer repeatability and accuracy



The new **WFDN Series** waterflow detectors from **System Sensor** consists of a rugged, NEMA 4-rated enclosure that is more damage resistant than previous metal designs. The waterflow detector is designed for both indoor and outdoor use, with the widest available temperature range, from 32°F to 150°F. They are also approved for installation on the widest range of pipe schedules, sizes 2 in. through 4 in. are approved for installation on pipe schedules 7 through 40.

UL-listed models are equipped with tamper-resistant cover screws to prevent unauthorized entry. Inside, two sets of SPDT (Form C) synchronized switches are enclosed in a durable terminal block with new layout designed to make wiring easy with wire ready terminals, COM terminals are on a different elevation, large barrier between switches and easy to read raised textured lettering all make wiring easy. An optional cover tamper switch is available, securely snaps into place, no tools required.

The WFDN series incorporates a mechanical time delay feature, which minimizes the risk of false alarm due to pressure surges or air trapped in the fire sprinkler system. The larger and easy to turn timer dial makes setting the waterflow detector easy with high contrast pad printed markings. The dial offers three tabs to help with turning, with one larger tab located on the dial position for approximately 60 seconds, a notch is also indicated on the dial to locate approximately 30 seconds making setting the detector in dimly lit locations easy.

The WFDN series is designed for accuracy and repeatability. The detector also offers improved performance during vibration in riser applications where detectors are exposed to a large in rush of water.

Agency Listings



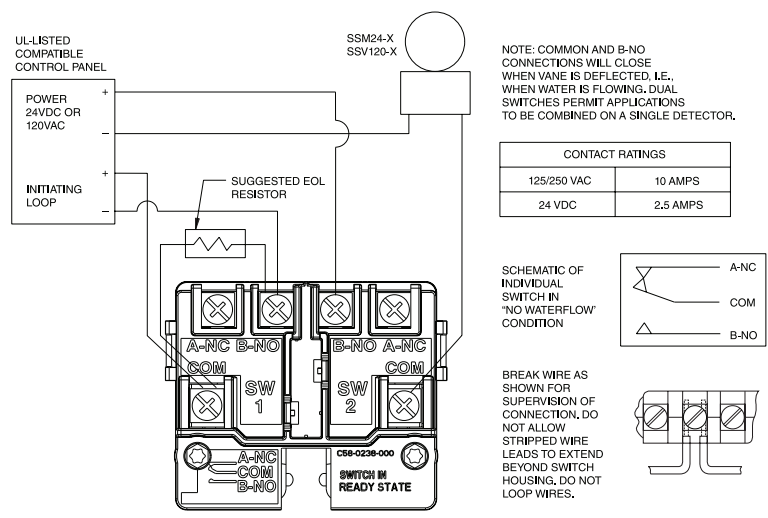
Waterflow Detector Specifications

Engineering Specifications

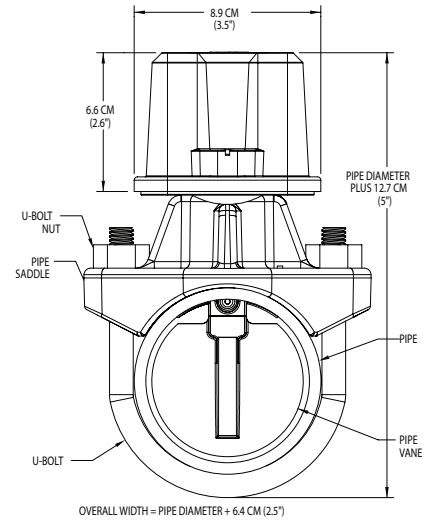
Vane-type waterflow detectors shall be installed on system piping as designated on the drawing and/or as specified herein. Detectors shall mount on any clear pipe span of the appropriate nominal size, either a vertical upflow or horizontal run, at least 6 in. from any fittings that may change water direction, flow rate, or pipe diameter or no closer than 24 in. from a valve or drain. Detectors shall have a sensitivity in the range of 4 to 10 gallons per minute and a static pressure rating of 450 psi for 2 in. – 8 in. pipes. The detector shall respond to waterflow in the specified direction after a preset time delay that is field adjustable. The delay mechanism shall be a sealed mechanical pneumatic unit with visual and audible indication of actuation. The actuation mechanism shall include a ethylene vinyl acetate vane inserted through a hole in the pipe and connected by a mechanical linkage to the delay mechanism. Outputs shall consist of dual SPDT switches (Form C contacts). Two conduit entrances for standard fittings of commonly used electrical conduit shall be provided on the detectors. A grounding provision is provided. Unless noted, enclosures shall be NEMA 4 listed by Underwriters Laboratories Inc. All detectors shall be listed by Underwriters Laboratories Inc. for indoor or outdoor use.

Standard Specifications			
Static Pressure Rating	450 PSI	Operating Temperature Range	32°F to 150°F (0°C to 66°C)
Maximum Surge	18 Feet Per Second (FPS)	Enclosure Rating*	NEMA 4 – suitable for indoor/outdoor use
Triggering Threshold Bandwidth (Flow Rate)	4–10 GPM	Cover Tamper Switch	Standard with ULC models, optional for UL models, part no. CTS
Conduit Entrances	Two openings for ½ in. conduit. NEMA 4 rated plugs	Service Use	Automatic Sprinkler: NFPA-13 One or Two Family Dwelling: NFPA 13D Residential Occupancies up to 4 Stories: NFPA 13R National Fire Alarm Code: NFPA-72
Contact Ratings	Two sets of SPDT (Form C) 10.0 A, ½ HP @ 125/250 VAC 2.5 A @ 6/12/24 VDC	Warranty	3 Years
Compatible Pipe	Steel water pipe, schedule 7 through 40*		

WFDN Field Wiring Diagram



Overall Dimensions, Installed



Ordering Information

UL Model	ULC Model	Pipe Size	Hole Size	Shipping Weights
WFD20N	WFD20NA	2 in.	1¼ in.	2.6 lbs.
WFD25N	WFD25NA	2½ in.	1¼ in.	2.6 lbs.
WFD30N	WFD30NA	3 in.	2 in.	3.1 lbs.
WFD40N	WFD40NA	4 in.	2 in.	4.0 lbs.
WFD50N	WFD50NA	5 in.	2 in.	4.9 lbs.
WFD60N	WFD60NA	6 in.	2 in.	5.6 lbs.
WFD80N	WFD80NA	8 in.	2 in.	7.3 lbs.

Accessories	
FS-RT	Delay mechanism and switch assembly
CTS	Tamper-proof switch kit
WFDW	Tamper-proof wrench for cover

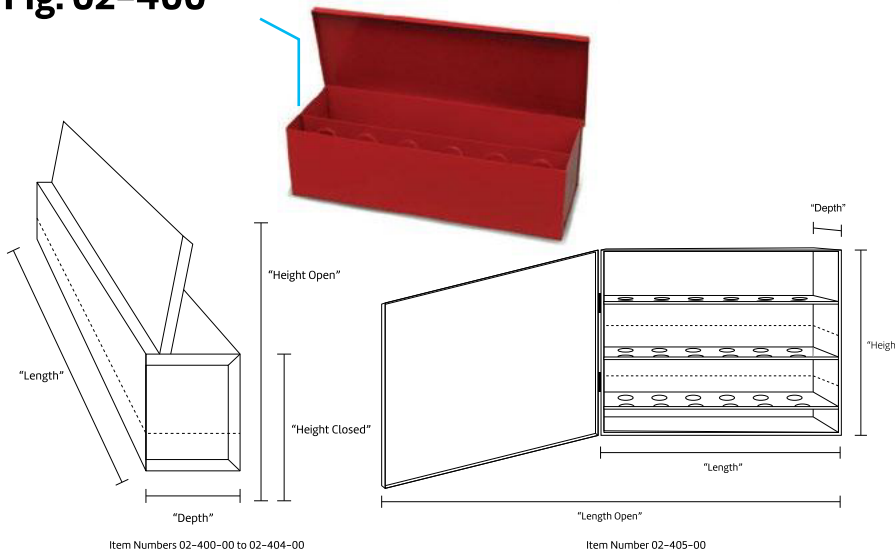
* 2 in. - 4 in. rated for use with Schedule 7 through 40 pipe, 6 in. - 8 in. rated for use with Schedule 10 through 40 pipe.



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 WFD87903 • 11/16

Spare Sprinkler Head Storage Cabinet Fig. 02-400



Specifications

Material:

Steel – 22 Gauge

Finish:

Red enamel

Styles:

- 3 Spare sprinklers, 1/2" or 3/4"
- 6 Spare sprinklers, 1/2" or 3/4"
- 6 Spare, ESFR, 1/2", 3/4" or 1"
- 12 Spare sprinklers 1/2" or 3/4"
- 24 Spare sprinklers
- 36 Spare sprinklers

Cabinet Type	Length	Depth	Height	Height (open)
12 head cabinet (02-400-00)	14 1/4"	4"	5 1/4"	10 7/16"
6 head cabinet (02-401-00)	14 1/4"	2 7/16"	5 1/4"	10 1/4"
3 head cabinet (02-402-00)	7 5/16"	2 1/2"	5 1/4"	10 1/4"
ESFR cabinet 6 head (02-403-00)	14 1/4"	3 3/16"	6 1/2"	12 3/4"
24 head cabinet (02-404-00)	14 1/4"	4"	8 7/16"	17"
36 head cabinet (02-405-00)	12 5/8"	4"	11 3/4"	26 11/16" (Length open)

Description

Fire Protection Products, Inc. Spare Sprinkler Head Cabinets are designed to allow for spare sprinkler head storage as required by NFPA guidelines. The Spare Sprinkler Head Cabinets are available in six configurations. Three head, six head, six head ESFR, twelve head, twenty-four head, and thirty-six head. All six styles are manufactured with "knockouts" to accommodate the most common size sprinklers. The shelf is positioned to allow for the storage of a typical sprinkler head wrench. Each cabinet is finished in red enamel. Each spare head cabinet comes with a hinged door which remains closed to protect the spare sprinklers from the elements and features holes on the back panel to allow for attachment to most surfaces utilizing the appropriate fasteners. Not intended for exposed or harsh environments.

Installation

Select the correct Spare Sprinkler Head Cabinet in accordance with the Automatic Sprinkler Systems Handbook. As per the 1989 Edition the correct number of spare sprinkler is as follows:

0-300 sprinklers, not less than 6; 300-1000, not less than 12; 1000 or more, not less than 24. Stock of spare sprinklers shall include all types and ratings installed.*

Once the correct Spare Sprinkler Head Cabinet has been selected, installation is accomplished by inserting the correct fastener in each of the holes inside the cabinet, securing the cabinet securely to the wall. Insert the correct number and type of sprinklers in accordance with the "handbook".

*Final determination is subject to approval by the AHJ.



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:	

Pressure Gauge Kits Fig. 11-565



Specifications

- 11-565 Pressure Gauge Kit, Water
- 11-566 Pressure Gauge Kit, Air-Water
- 11-567 Pressure Gauge Kit, Air
- 11-568 Pressure Gauge Kit, Air w/Retard
- 11-569-00 Gauge Kit, Air- Water, Personalized

Description

FPPI's Sprinkler Gauge Kits provide everything needed to install a fire sprinkler gauge to a riser or other device. Each kit contains a pressure gauge that is UL Listed and FM approved for Fire Sprinkler Service, 1/4" brass 3-way valve (UL/ ULc Listed), 1/4" x 1/2" galvanized reducer, 1/4" IPS x 4" galvanized pipe nipple and a 1/4" IPS galvanized plug. Each kit is shrink wrapped to a sturdy cardboard backing to prevent the loss of the components before being installed at the job site. Available with Water, Air-Water, Air or Air with Retard fire gauge.

The information contained herein is produced in good faith and is believed to be reliable but is provided for guidance and information purposes only. FPPI and its agents cannot assume liability or responsibility for results obtained in the use or misuse of its product by persons whose methods and qualifications are outside and beyond our control. It is the user's responsibility to determine the suitability of, methods of use, preparation prior to use, and appropriate installation for all products purchased from FPPI. It is the user's sole responsibility to observe and adapt such precautions as may be advisable or necessary for the protection of personnel and property in the handling and use of any of our products.



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:	

Reliable®

Model TD Test and Drain Valve

300 psi (20.7 bar) pressure rated

cULus Listed, FM Approved

Product Description

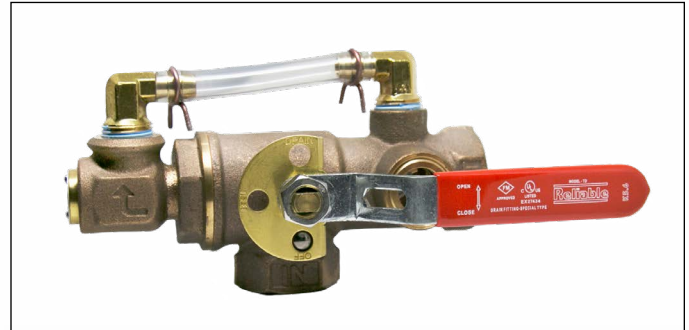
The Reliable Model TD Test and Drain Valve is a single-handle, tri-position ball valve allowing both testing of the waterflow alarm and draining of a wet-pipe fire protection system. The valves are cULus Listed and FM Approved. The Model TD Valve has a pressure rating of 300 psi (20.7 bar), and is factory tested at 600 psi (41.1 bar).

Model TD Test and Drain Valves have a restricted orifice with the available K-factors listed in Table A. Nominal valve sizes are 1", 1-1/4", and 2" with either NPT or ISO7-1 female threaded connections. 1-1/4" and 2" versions are also available with ANSI/AWWA C606 grooved inlet connections. Table C identifies the materials used in the Model TD valve.

The Model TD valve is available with an optional relief valve kit. The relief valve kit includes a Reliable Model A relief valve along with a hose and all fittings needed to connect the relief valve to the Model TD valve. The Model A relief valve is UL Listed and FM Approved for use on fire protection systems. The Model A relief valve is available with a nominal pressure rating of 175 psi (12 bar), 185 psi (13 bar), 210 psi (14 bar), 260 psi (18 bar), or 310 psi (21 bar). See Reliable Technical Bulletin 257 for additional information on the Model A relief valve. An optional locking handle kit is available for use with customer supplied padlocks.

Installation

Connect the "IN" port of the Model TD valve to the wet-pipe sprinkler system. Connect the "OUT" port to a properly sized drain. The optional relief valve kit is installed as shown in the photographs in this bulletin after removing the plugs in the cap and body of the Model TD valve. The relief valve is commonly installed after hydrostatic testing.



Model TD Test & Drain Valve 1" with optional relief valve kit; threaded inlet



Model TD Test & Drain Valve 2" with optional relief valve kit; grooved inlet

Operation

To run a test, rotate the handle counter-clockwise until the "Test" position is aligned with the ball detent. Note that rotating the valve to the "test" position is intended to operate the sprinkler system's waterflow alarm. To drain, rotate the handle further until the "Drain" position is aligned with the ball detent. Return the handle to the "Off" position when all testing and draining functions have been completed.

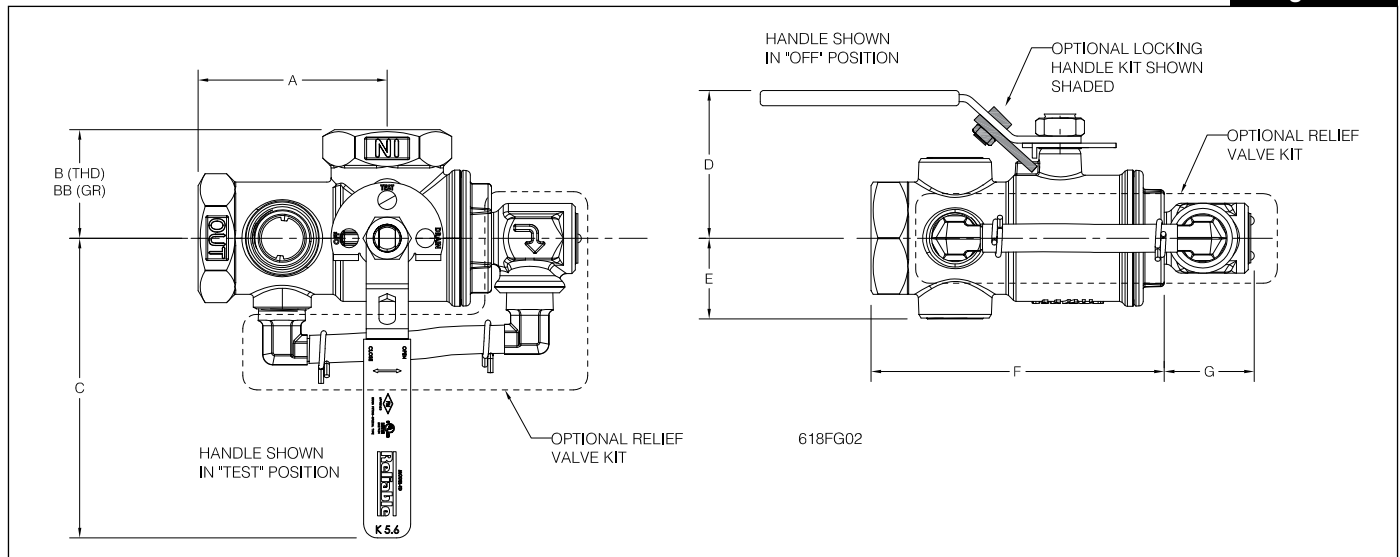
Table A

Nominal Valve Size	Available K-factors* gpm/psi ^{1/2} (L/min/bar ^{1/2})	Inlet Connection	Outlet Connection
1"	2.8 (40), 4.2 (60), 5.6 (80)	NPT, ISO7-1 Threaded	NPT, ISO7-1 Threaded
1 1/4"	2.8 (40), 4.2 (60), 5.6 (80), 8.0 (115), 11.2 (160)	NPT, ISO7-1 Threaded	
2"	2.8 (40), 4.2 (60), 5.6 (80), 8.0 (115), 11.2 (160), 16.8 (240)	C606 Grooved	

***Note:** Valve K-factor must be equal to or less than the K-factor of the smallest K-factor sprinkler installed on the sprinkler system. For sprinkler systems where the smallest K-factor sprinkler on the system is greater than the largest available valve K-factor, use any valve K-factor that will provide a min. flow of 10 gpm (38 lpm) as required to operate a UL Listed Waterflow Switch.

Model TD Test and Drain Valve with optional relief valve kit & locking handle kit

Figure 1



Component Dimensions (refer to Figure 1)

Table B

Valve Size	A	B	BB	C	D	E	F	G
Model TD Test and Drain 1" Valve	3-3/8" (86mm)	1-11/16" (43mm)	N/A	5-1/2" (140mm)	2-9/16" (65mm)	1-7/16" (37mm)	5-1/4" (133mm)	1-3/4" (44mm)
Model TD Test and Drain 1-1/4" Valve	3-3/8" (86mm)	1-15/16" (49mm)	2-5/16" (59mm)	5-1/2" (140mm)	2-5/8" (67mm)	1-7/16" (37mm)	5-1/4" (133mm)	1-3/4" (44mm)
Model TD Test and Drain 2" Valve	4-1/16" (103mm)	2-7/8" (73mm)	2-7/8" (73mm)	7-5/8" (194mm)	3-1/2" (89mm)	1-15/16" (49mm)	6-3/4" (171mm)	1-3/4" (44mm)

Materials

Table C

Component	Material
Body	Brass alloy
Stem seal	Nitrile
End cap seal	Nitrile
Stem washer	PTFE
Nest	PTFE
Stem	Brass alloy
Ball	Chrome plated brass alloy
End cap	Brass alloy
Spring detent	Stainless steel
Ball detent	Stainless steel
Plate washer	Delrin
Function plate	Brass alloy
Handle	Plated carbon steel
Nut, handle	Stainless steel
Sight glass seal	EPDM
Sight glass	Glass
Sight glass gasket	PTFE
Sight glass retainer	Brass alloy
Pipe plug	Brass alloy

Maintenance

Reliable Model TD valve should be inspected and the sprinkler system maintained in accordance with NFPA 25, as well as the requirements of any Authorities Having Jurisdiction.

Guarantee

For the Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify the following when ordering:

Model TD Test and Drain Valve

Valve Size (1", 1-1/4", 2")

K-factor (See Table A)

Inlet/Outlet Connection (Thd x Thd [all sizes], Gr x Thd [1-1/4" & 2" sizes only])

Threads (NPT, ISO7-1)

Optional Accessories:

Relief Valve Kit [175 psi (12 bar), 185 psi (13 bar), 210 psi (14 bar), 260 psi (18 bar), or 310 psi (21 bar)]

Locking Handle Kit

1" & 1-1/4" Valve size P/N 6990021646

2" Valve size P/N 6990021647

Reliable®

Model G Swing Check Valve

1-1/2", 2", 2-1/2", 3", 4", 6", 8", & 10" Sizes

cULus Listed, FM Approved

Features

- Grooved end connections.
- Compact, lightweight design.
- Non-slamming, spring loaded clapper to minimize water hammer.
- Approved for horizontal and vertical installation.
- Streamlined body design provides very low friction loss.

Product Description

Reliable Model G Swing Check Valves are low friction loss check valves approved for use in fire protection systems. Typical applications include connections between public water supplies and private fire systems, at the discharge from fire pumps, at gravity tank connections and at fire department pumper connections. All Model G Check Valves are provided with 1/2" NPT (R1/2) supply side and discharge side connections (Item 12, Figure 1). Grooved end connections provide fast and easy installation using listed or approved mechanical grooved couplings. Rigid style grooved couplings can be used for positive clamping to resist flexural and torsional loads.

Installation

The Model G Check Valve shall be installed in accordance with NFPA 13, "Standard for the Installation of Sprinkler Systems," as well as the requirements of any authorities having jurisdiction. When installed vertically, the direction of flow shall be up through the valve (install with flow arrow pointed up). For horizontal installations, the hinge pin must be located to the top. Failure to follow installation instructions may void the warranty and listing of the valve. Verify compatibility of the Model G Check Valve materials with the water supply and the environment where the valve will be installed prior to installation. Do not apply lubricants, sealants, or other chemicals to the clapper seal or seat.



Reliable Model G Swing Check Valve (3")

Note: Model G Check Valves may be damaged by excessively turbulent water flow. Model G Check Valves should be installed a reasonable distance from pipe transitions, such as pumps, elbows, expanders, reducers, or similar devices. Typical piping practices suggest a minimum distance of five times the pipe diameter for general use.

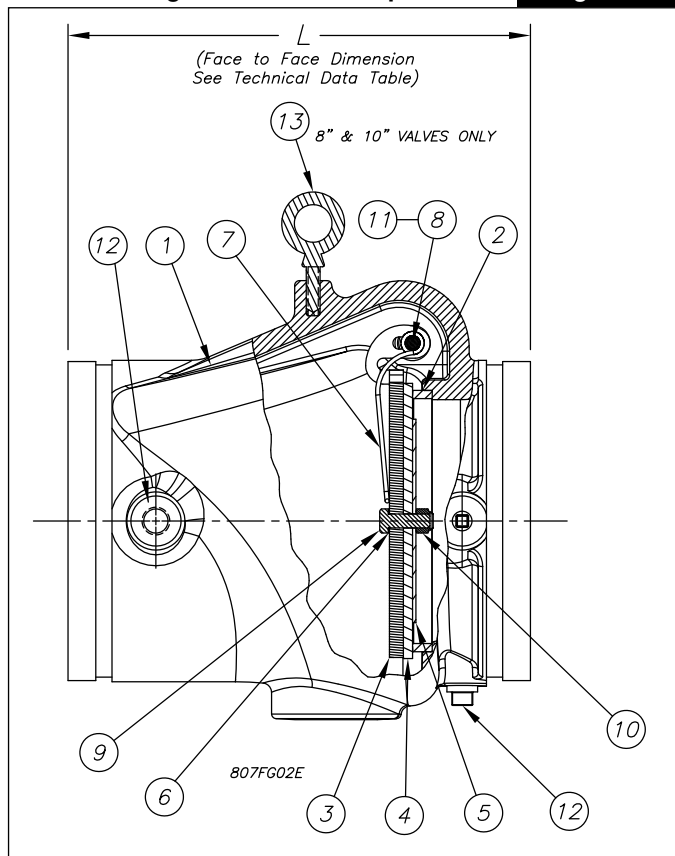
Technical Data

Table A

Valve Size	Pressure Rating	Face-to-Face Dimension	Eq. Length C = 120	Eq. Length C = 100	Cv Factor	Shipping Weight
1-1/2" (40 mm)	300 psi (20.7 bar)	6-1/4" (159 mm)	6.7' (2.0 m)	4.8' (1.5 m)	36	5 lbs (2.3 kg)
2" (50 mm)		6-1/2" (165 mm)	9.6' (2.9 m)	6.8' (2.1 m)	67	6 lbs (2.7 kg)
2-1/2" (65 mm)	250 psi (17.2 bar)	7.12" (181 mm)	6.0' (1.8m)	4.3' (1.3m)	212	9 lbs (4.1 kg)
76 mm		7.12" (181 mm)	6.0' (1.8m)	4.3' (1.3m)	212	9 lbs. (4.1 kg)
3" (80 mm)		7.62" (194 mm)	5.3' (1.6m)	3.8' (1.2m)	376	11 lbs. (5.0 kg)
4" (100 mm)		8.44" (214 mm)	7.1' (2.2m)	5.0' (1.5m)	656	17 lbs. (7.7 kg)
6" (150 mm)		10.25" (260 mm)	13.7' (4.2m)	9.8' (3.0m)	1395	38 lbs. (17.2 kg)
165 mm		10.25" (260 mm)	13.7' (4.2m)	9.8' (3.0m)	1395	38 lbs. (17.2 kg)
8" (200 mm)	300 psi (20.7 bar)	12.5" (318 mm)	15.9' (4.8m)	11.3' (3.4m)	2818	63 lbs. (28.6 kg)
10" (250 mm)		14.5" (368 mm)	28.8' (8.8m)	20.6' (6.3m)	3928	102 lbs. (46.3 kg)

Model G Swing Check Valve Components

Figure 1



Valve Components (refer to Figure 1)

Table B

Item No.	Part Name	Material
1	Valve Body	Gray Cast Iron Class 30
2	Seat	Bronze C83600 or C93200
3	Clapper	Stainless Steel 304 or 17-4
4	Facing Seal *	EPDM Rubber
5	Clamping Ring	Stainless Steel 304
6	Gasket *	EPDM Rubber or PTFE
7	Spring	Stainless Steel 302
8	Hinge Pin	Stainless Steel 303
9	Bolt	Stainless Steel 18-8
10	Locknut *	Stainless Steel 18-8
11	Plug, 1/8" NPT	Steel
12	Plug, 1/2" NPT	Steel
13	Shoulder Eye	Steel

* Part of Replacement Seal Kit

Replacement Seal Kit Part Numbers

Table C

Part Number									
1-1/2" (40 mm)	2" (50 mm)	2 1/2" (65 mm)	76 mm	3" (80 mm)	4" (100 mm)	6" (150 mm)	165 mm	8" (200 mm)	10" (250 mm)
6888000015	6888000020	6888040025	6888040025	6888040030	6888040040	6888040060	6888040060	6888040080	6888040090

Maintenance

The owner is responsible for maintaining the fire protection system in proper operating condition. Any system maintenance or testing that involves placing a system out of service may eliminate the fire protection that is provided by the fire protection system. Notify any required authorities having jurisdiction and implement appropriate precautions prior to proceeding.

The Reliable Model G Check Valve shall periodically be given a thorough inspection and test. NFPA 25, "Inspection, Testing and Maintenance of Water Based Fire Protection Systems," provides minimum maintenance requirements. Inspect the interior of the valve and all components for corrosion, damage, and wear at least every five (5) years. Replace any components found to be corroded, damaged, or worn. Increase the frequency of inspections when the valve is exposed to corrosive conditions or chemicals that could impact the valve materials.

Guarantee

For Reliable Automatic Sprinkler Co., Inc. guarantee, terms, and conditions, visit www.reliablesprinkler.com.

Ordering Information

Specify:

1. Model G Check Valve.
2. Size.

FireLock® Butterfly Valve

Series 705 with Weatherproof Actuator



1.0 PRODUCT DESCRIPTION

- Available Sizes: 2 – 12”/50 – 300 mm
- cULus Listed, LPCB Listed, FM and VdS Approved for service up to 300 psi/2068 kPa /20 bar.
- Designed for fire protection services only.
- Features a weatherproof actuator housing Approved for indoor and outdoor use.
- Actuation options: Hand wheel (2 – 12”/50 – 300 mm)
- Exclusively for use with pipe and Victaulic products which feature ends formed with the Victaulic Original Groove System (OGS) groove profile (see section 7.0 for Reference Materials).

2.0 CERTIFICATION/LISTINGS



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	

2.1 CERTIFICATION/LISTINGS

Size	Approval/Listing Service Pressures			
	Series 705 Butterfly Valve			
	cULus	FM	Vds	LPCB
2 50	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
2½ 65	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa
76.1 mm	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
3 80	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
4 100	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
5 125	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa
139.7 mm	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
6 150	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
165.1 mm	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa
8 200	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa	up to 300psi/2068kPa
10 250	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa
12 300	up to 300psi/2068kPa	up to 300psi/2068kPa	n/a	up to 300psi/2068kPa

3.0 SPECIFICATIONS – MATERIAL

Body: Ductile Iron conforming to ASTM A-536, Grade 65-45-12

End Face, 2 – 6”/50 – 150 mm: Ductile Iron conforming to ASTM A-536, Grade 65-45-12

Seal Retainer, 8 – 12”/200 – 300 mm: Ductile Iron conforming to ASTM A-536, Grade 65-45-12

Body Coating: Black alkyd enamel

Disc: Ductile Iron conforming to ASTM A-536, Grade 65-45-12, with electroless nickel coating conforming to ASTM B-733

Seat: Grade “E” EPDM

Stems: 416 stainless steel conforming to ASTM A-582

Stem Seal Cartridge: C36000 brass

Bearings: Stainless steel with TFE lining

Stem Seals: EPDM

Stem Retaining Ring: Carbon steel

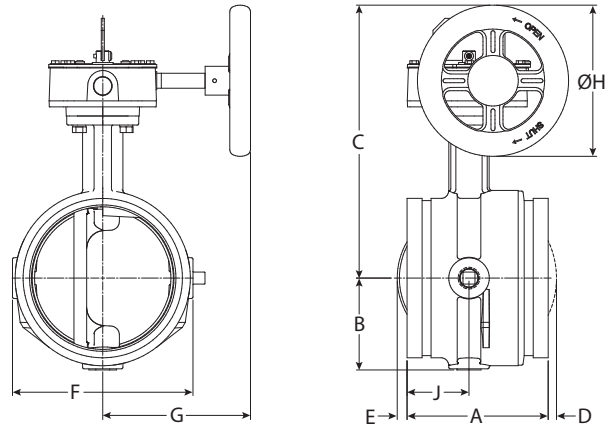
Actuator:

2 – 8”/50 – 200mm: Brass or bronze traveling nut on a steel lead screw, in a ductile iron housing

10 – 12”/250 – 300mm: Steel worm and cast iron quadrant gear, in a cast iron housing

4.0 DIMENSIONS

Series 705



Size		Dimensions								
Nominal inches mm	Actual Outside Diameter inches mm	E to E A inches mm	B inches mm	C inches mm	D inches mm	E inches mm	F inches mm	G inches mm	DIA H inches mm	J inches mm
2 60.3	2.375 60.3	4.25 108.0	2.28 57.9	6.41 162.8	-	-	4.00 101.6	4.22 107.2	4.50 114.3	2.12 53.8
2½ 73	2.875 73.0	3.77 95.8	2.28 57.9	7.54 191.5	-	-	4.00 101.6	4.22 107.2	4.50 114.3	1.77 45.0
76.1 mm	3.000 76.1	3.77 95.8	2.28 57.9	7.54 191.5	-	-	4.00 101.6	4.22 107.2	4.50 114.3	1.77 45.0
3 88.9	3.500 88.9	3.77 95.8	2.53 64.3	7.79 197.9	-	-	4.50 114.3	4.22 107.2	4.50 114.3	1.77 45.0
108 mm	4.250 108.0	4.63 117.6	2.88 73.2	8.81 223.8	-	-	5.50 139.7	4.22 107.2	4.50 114.3	2.20 55.9
4 114.3	4.500 114.3	4.63 117.6	2.88 73.2	8.81 223.8	-	-	5.50 139.7	4.22 107.2	4.50 114.3	2.20 55.9
133 mm	5.250 133.0	5.88 149.4	3.35 85.1	10.88 276.4	-	-	6.56 166.6	6.19 157.2	6.30 160.0	2.58 65.5
139.7 mm	5.500 139.7	5.88 149.4	3.35 85.1	10.88 276.4	-	-	6.56 166.6	6.19 157.2	6.30 160.0	2.58 65.6
5 141.3	5.563 141.3	5.88 149.4	3.35 85.1	10.88 276.4	-	-	6.56 166.6	6.19 157.2	6.30 160.0	2.58 65.5
159 mm	6.250 159.0	5.88 149.4	3.84 97.5	11.38 289.1	-	0.41 10.4	7.52 191.0	6.19 157.2	6.30 160.0	2.58 65.5
165.1 mm	6.500 165.1	5.88 149.4	3.84 97.5	11.38 289.1	-	0.41 10.4	7.52 191.0	6.19 157.2	6.30 160.0	2.58 65.5
6 168.3	6.625 168.3	5.88 149.4	3.84 97.5	11.38 289.1	-	0.41 10.4	7.52 191.0	6.19 157.2	6.30 160.0	1.90 48.3
8 219.1	8.625 219.1	5.33 135.4	5.07 128.8	13.53 343.6	0.80 20.3	1.47 37.3	10.00 254.0	6.19 157.2	8.10 205.7	2.33 59.2
10 273	10.750 273.0	6.40 162.6	6.37 161.8	15.64 397.3	1.41 35.8	1.81 46.0	12.25 311.2	8.10 205.7	9.00 228.6	-
12 323.9	12.750 323.9	6.50 165.1	7.36 186.9	16.64 422.7	2.30 58.4	2.80 71.1	14.25 362.0	8.10 205.7	9.00 228.6	-

NOTE

- Optional ½"/15 mm tap available. Contact Victaulic for details.

5.0 PERFORMANCE

Series 705

The chart expresses the frictional resistance of Victaulic Series 705 Butterfly Valve in equivalent feet/meters of straight pipe.

Nominal Size mm inches	Outside Diameter mm inches	Equivalent
		Feet/m of pipe
2 50	2.375 60.3	6 1.8
2½ 65	2.875 73.0	6 1.8
76.1 mm	3.000 76.1	6 1.8
3 80	3.500 88.9	7 2.1
4 100	4.500 114.3	8 2.4
108 mm	108 mm	8 2.4
5 125	5.563 141.3	12 3.7
133 mm	133 mm	12 3.7
139.7 mm	5.500 139.7	12 3.7
6 150	6.625 168.3	14 4.2
159 mm	159 mm	14 4.3
165.1 mm	6.500 165.1	14 4.2
8 200	8.625 219.1	16 4.9
10 250	10.750 273.0	18 5.5
12 300	12.750 323.9	19 5.8

5.1 PERFORMANCE

Series 705

C_v values for flow of water at +60°F/+16°C through a fully open valve are shown in the table below. For additional details, contact Victaulic.

Formulas for C_v values

$$\Delta P = \frac{Q^2}{C_v^2}$$

$$Q = C_v \times \sqrt{\Delta P}$$

Where:

Q = Flow (GPM)
 ΔP = Pressure Drop (psi)
 C_v = Flow Coefficient

Formulas for K_v values

$$\Delta P = \frac{Q^2}{K_v^2}$$

$$Q = K_v \times \sqrt{\Delta P}$$

Where:

Q = Flow (m³/hr)
 ΔP = Pressure Drop (Bar)
 K_v = Flow Coefficient

Valve Size		Full Open
Nominal Size inches mm	Actual Outside Diameter inches mm	Flow Coefficient C_v
2 50	2.375 60.3	170
2½ 65	2.875 73.0	260
76.1 mm	3.000 76.1	260
3 80	3.500 88.9	440
4 100	4.500 114.3	820
108 mm	108 mm	820
5 125	5.563 141.3	1200
133 mm	133 mm	1200
139.7 mm	5.500 139.7	1200
6 150	6.625 168.3	1800
159 mm	159 mm	1800
165.1 mm	6.500 165.1	1800
8 200	8.625 219.1	3400
10 250	10.750 273.0	5800
12 300	12.750 323.9	9000

Valve Size		Full Open
Nominal Size inches mm	Actual Outside Diameter inches mm	Flow Coefficient K_v
2 50	2.375 60.3	147
2½ 65	2.875 73.0	225
76.1 mm	3.000 76.1	225
3 80	3.500 88.9	380
4 100	4.500 114.3	710
108 mm	108 mm	710
5 125	5.563 141.3	1040
133 mm	133 mm	1040
139.7 mm	5.500 139.7	1040
6 150	6.625 168.3	1560
159 mm	159 mm	1560
165.1 mm	6.500 165.1	1560
8 200	8.625 219.1	2940
10 250	10.750 273.0	5020
12 300	12.750 323.9	7790

6.0 NOTIFICATIONS

WARNING



- Read and understand all instructions before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Depressurize and drain the piping system before attempting to install, remove, adjust, or maintain any Victaulic piping products.
- Wear safety glasses, hardhat, and foot protection.

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

7.0 REFERENCE MATERIALS

Switch and Wiring

1. The supervisory switch contains two single pole, double throw, pre-wired switches.
2. Switches are rated:
10 amps @ 125 or 250 VAC/60 Hz
0.50 amps @ 125 VDC
0.25 amps @ 250 VDC
3. Switches supervise the valve in the “OPEN” position.
5. One switch has two #18 insulated wires per terminal, which permit complete supervision of leads (refer to diagrams and notes below). The second switch has one #18 insulated wire per terminal. This double circuit provides flexibility to operate two electrical devices at separate locations, such as an indicating light and an audible alarm, in the area that the valve is installed.
6. A #14 insulated ground lead (green) is provided.

Switch #1 = S1

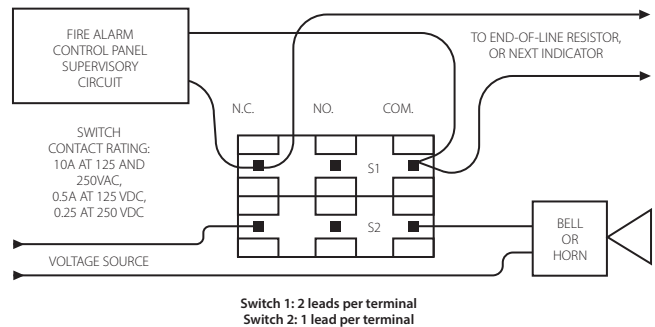
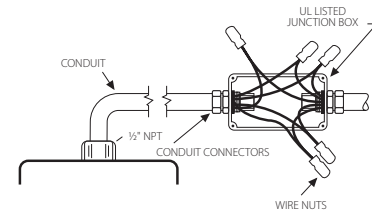
For connection to the supervisory circuit of a UL Listed alarm control panel

Switch #2 = S2

Auxiliary switch that may be connected to auxiliary devices, per the authority having jurisdiction

S1 { Normally Closed: (2) Blue
Common: (2) Yellow

S2 { Normally Closed: Blue with Orange Stripe
Normally Open: Brown with Orange Stripe
Common: Yellow with Orange Stripe



NOTES

- The above diagram shows a connection between the common terminal (yellow – S1 and yellow-with-orange stripe – S2) and the normally closed terminal (blue – S1 and blue-with-orange stripe – S2). In this example, the indicator light and alarm will stay on until the valve is fully open. When the valve is fully open, the indicator light and alarm will go out. Cap off any unused wires (e.g. brown with orange stripe).
- Only S1 (two leads per terminal) may be connected to the fire alarm control panel.
- The connection of the alarm switch wiring shall be in accordance with NFPA 72 and the auxiliary switch per NFPA 70 (NEC).

7.1 REFERENCE MATERIALS

[10.01: Regulatory Approval Reference Guide](#)

[29.01: Terms and Conditions/Warranty](#)

[I-100: 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.

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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.

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.

Fire Sprinkler Pipe

Schedule 10 and Schedule 40

Submittal Data Sheet



FM Approved and Fully Listed Sprinkler Pipe

Wheatland Tube's Schedule 10 and Schedule 40 steel fire sprinkler pipe is FM Approved and UL® and C-UL Listed.

Approvals and Specifications

Schedule 10 and Schedule 40 meet or exceed the following standards:

- ASTM A135, Type E, Grade A (Schedule 10, 1-8 NPS)
- ASTM A795, Type E, Grade A (Schedule 40, 1-2 NPS)
- ASTM A53, Type E, Grade B (Schedule 40, 2-8 NPS)
- ASTM A53, Type F, Grade A (Schedule 40, 1-4 NPS)
- NFPA® 13 and NFPA 14

Manufacturing Protocols

Schedule 10 and Schedule 40 are subjected to the toughest possible testing protocols to ensure the highest quality and long-lasting performance.

Finishes and Coatings

All Wheatland black steel fire sprinkler pipe receives a proprietary mill coating to ensure a clean, corrosion-resistant surface that outperforms and outlasts standard lacquer coatings. This coating allows the pipe to be easily painted, without special preparation. Schedule 10 and Schedule 40 can be ordered in black or hot-dip galvanized, to meet FM/UL requirements for dry systems that meet the zinc coating specifications of ASTM A795 or A53.

Product Marking

Each length of Wheatland fire sprinkler pipe is continuously stenciled to show the manufacturer, type of pipe, grade, size and length. Bar coding is acceptable as a supplementary identification method.

SUBMITTAL INFORMATION

PROJECT:

CONTRACTOR:

DATE:

ENGINEER:

SPECIFICATION REFERENCE:

SYSTEM TYPE:

LOCATIONS:

COMMENTS:

BLACK

HOT-DIP GALVANIZED



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Wheatland, PA 16161
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wheatland.com
Follow us on Twitter:
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Wheatland Tube
A DIVISION OF ZEKELMAN INDUSTRIES



No. 20 Tee



No. 10 Elbow

1.0 PRODUCT DESCRIPTION

Available Sizes

- $\frac{3}{4}$ – 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.

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



EN 10311
CPR (EU)
No. 305/2011



BS EN 10311
CPR (UK)
2019 No. 465



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

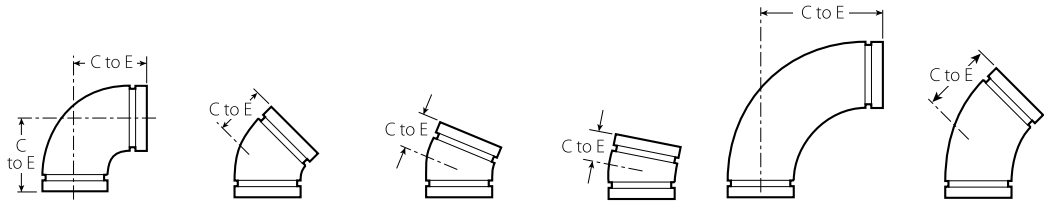
No. 11 45° Elbow

No. 12 22 1/2° Elbow

No. 13 11 1/4° 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 22 1/2° Elbow		No. 13 11 1/4° 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
3/4 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 ¹ 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 1/4 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 1/2 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 1/2 DN65	2.875 73.0	3.75 95	3.2 1.5	2.25 57	2.2 1.0	4.00 ¹ 102	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
	3.000 76.1	3.75 95	3.7 1.7	2.25 57	3.4 1.5	2.25 57	—	1.50 38	—	—	—	—	—
3 DN80	3.500 88.9	4.25 108	4.5 2.0	2.50 64	3.1 1.4	4.50 ¹ 114	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
3 1/2 DN90	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 DN100	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 ¹ 159	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

¹ 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

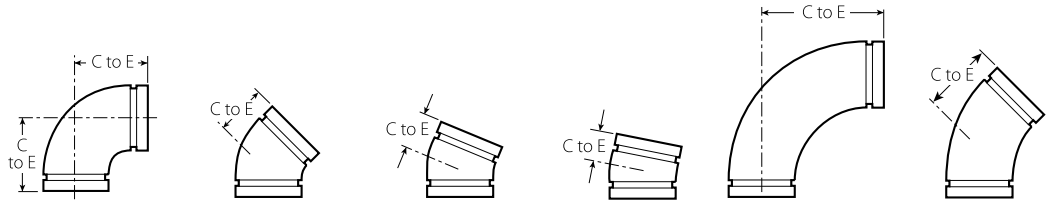
NOTE

- 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 22 1/2° Elbow
- No. 13 11 1/4° 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 22 1/2° Elbow		No. 13 11 1/4° 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
8 DN200	8.625 219.1	7.75 197	29.9 13.6	4.25 108	20.4 9.3	7.75 ¹ 197	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 ² 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 ² 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 ² 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 ² 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 ² 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 publication 20.05												

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

² 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

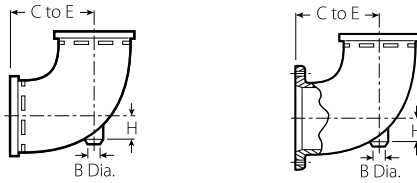
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

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	1.25	1.50	19.0	33.0
		229	32	38	8.6	15.0
8 DN200	x 6 DN150	9.00	1.50	1.50	23.0	38.0
		229	38	38	10.4	17.2
10 DN250	x 8 DN200	10.50	2.13	1.50	33.0	52.0
		267	24	38	15.0	23.6
		12.00	2.40	1.50	61.0	88.0
		305	61	38	27.7	39.9

4.2 DIMENSIONS

Adapter Elbow

No. 18 90° Adapter Elbow

No. 19 45° Adapter Elbow



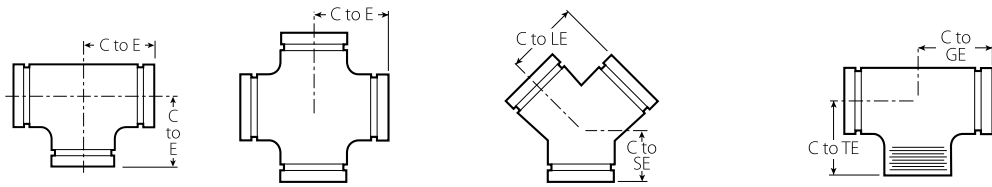
Size		No. 18 90° Adapter Elbow			No. 19 45° Adapter Elbow		
Nominal inches DN	Actual Outside Diameter inches mm	C to GE inches mm	C to TE inches mm	Approximate Weight (Each) lb kg	C to GE inches mm	C to TE inches mm	Approx. Weight (Each) lb kg
¾ DN20	1.050 26.9	2.25 57	2.25 57	0.5 0.2	1.50 38	1.50 38	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	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 DN65	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
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)

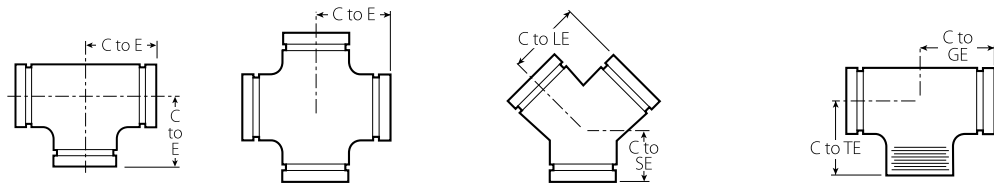
(sw) = Carbon Steel Segmentally Welded


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 ² 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 ² 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 ² 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 ² 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 ² 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 publication 20.05 										

² 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

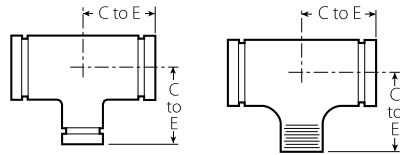
- All fittings are ductile iron unless otherwise noted with an (sw) or (s).

4.4 DIMENSIONS

Reducing Tee

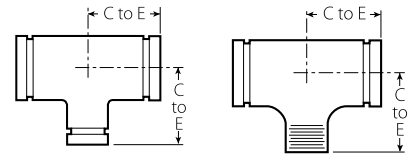
No. 25 Grooved Branch

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	3/4 DN20	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	3/4 DN20	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	3/4 DN20	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 (sw) 95	3.75 (sw) 95	4.5 2.0
3 DN80	x	3 DN80	3/4 DN20	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	3/4 DN20	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	1 DN25	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				1 DN25	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			
6 1/2	x	6 1/2	3 DN80	6.50 165	6.50 (sw) 165	24.0 10.9			
			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

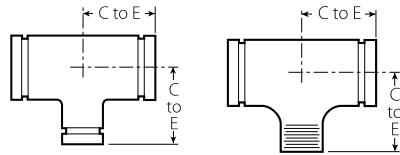
- Cast fitting available. Contact Victaulic for details.

4.4 DIMENSIONS (CONTINUED)

Reducing Tee

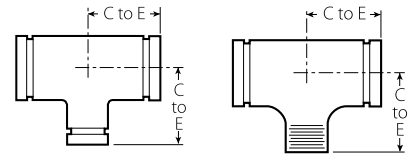
No. 25 Grooved Branch

No. 29T Threaded Branch



No. 25

No. 29T



No. 25

No. 29T

Size			No. 25 Std.	No. 29T w/ Thd. Branch	Approx. Weight (Each) lb kg		
Nominal inches DN			C to E inches mm	C to E inches mm			
8 DN200	x	8 DN200	x	1 1/2 DN40	7.75 (sw) 197	7.75 (sw) 197	33.0 15.0
				2 DN50	7.75 (sw) 197	7.75 (sw) 197	33.5 15.2
				2 1/2	7.75 (sw) 197	7.75 (sw) 197	39.0 17.7
				3 DN80	7.75 (sw) 197	7.75 (sw) 197	33.6 15.2
				4 DN100	7.75 197	7.75 197	41.8 19.0
				5	7.75 (sw) 197	7.75 (sw) 197	34.0 15.4
				6 DN150	7.75 197	7.75 197	42.3 19.2
				165.1mm	7.75 (sw) 197	7.75 (sw) 197	48.0 21.8
				10 DN250	x	10 DN250	x
2 DN50	9.00 (sw) 229	9.00 (sw) 229	62.0 28.1				
2 1/2	9.00 (sw) 229	9.00 (sw) 229	62.4 28.3				
3 DN80	9.00 (sw) 229	9.00 (sw) 229	60.0 27.2				
4 DN100	9.00 (sw) 229	9.00 (sw) 229	61.0 27.7				
5	9.00 (sw) 229	9.00 (sw) 229	52.0 23.6				
6 DN150	9.00 (sw) 229	9.00 (sw) 229	59.0 26.8				
8 DN200	9.00 (sw) 229	9.00 (sw) 229	64.7 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) lb kg		
Nominal inches DN			C to E inches mm	C to E inches mm			
12 DN300	x	12 DN300	x	1 DN25	10.00 (sw) 254	10.00 (sw) 254	77.0 34.9
				2 DN50	10.00 (sw) 254	10.00 (sw) 254	80.0 36.3
				2 1/2	10.00 (sw) 254	10.00 (sw) 254	78.0 35.4
				3 DN80	10.00 (sw) 254	10.00 (sw) 254	82.0 37.2
				4 DN100	10.00 (sw) 254	10.00 (sw) 254	80.0 36.3
				5	10.00 (sw) 254	10.00 (sw) 254	75.0 34.0
				6 DN150	10.00 (sw) 254	10.00 (sw) 254	75.0 34.0
				8 DN200	10.00 (sw) 254	10.00 (sw) 254	80.0 36.3
				10 DN250	10.00 (sw) 254	10.00 (sw) 254	84.0 38.1
				14 ² DN350	x	14 DN350	x
6 DN150	11.00 (sw) 279	11.00 (sw) 279	108.2 49.1				
8 DN200	11.00 279	11.00 279	112.0 50.8				
10 DN250	11.00 279	11.00 279	120.0 54.4				
12 DN300	11.00 279	11.00 279	129.1 58.6				
16 ² DN400	x	16 DN400	x				
6 DN150				12.00 (sw) 305	12.00 (sw) 305	133.5 60.6	
8 DN200				12.00 305	12.00 305	145.0 65.8	
10 DN250				12.00 305	12.00 305	149.5 67.8	
12 DN300				12.00 305	12.00 305	154.0 69.9	
14 DN350				12.00 (sw) 305	—	167.0 75.8	

² 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

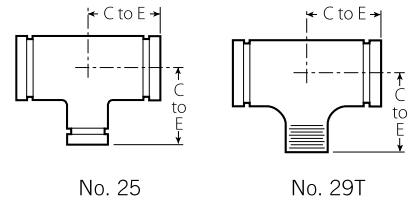
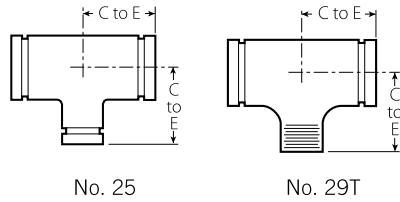
NOTE

- Cast fitting available. Contact Victaulic for details.

4.4 DIMENSIONS (CONTINUED)

Reducing Tee

No. 25 Grooved Branch
 No. 29T Threaded Branch



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 ² DN450	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	15.50 (sw) 394	202.0 91.6	
			10 DN250	15.50 394	15.50 394	212.0 96.2
		12 DN300	15.50 394	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	
		20 ² DN500	20 DN500	6 DN150	17.25 438	240.0 108.9
					8 DN200	17.25 438
				10 DN250	17.25 438	17.25 438
12 DN300	17.25 438				17.25 438	264.0 119.8
14 DN350	17.25 438			—	275.0 124.7	
16 DN400	17.25 438			—	288.6 130.9	
18 DN450	17.25 438			—	297.0 134.7	

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 ² DN600	24 DN600	8 DN200	340.0 154.2	
		10 DN250	343.9 156.0	
		12 DN300	352.8 160.0	
		14 DN350	360.0 163.3	
		16 DN400	378.0 171.5	
		18 DN450	380.0 172.4	
		20 DN500	373.0 169.2	
		For AGS fitting information, see publication 20.05		
		14 – 60 DN350 – 1500		

² 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.

² 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

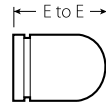
NOTE

- Cast fitting available. Contact Victaulic for details.

4.5 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

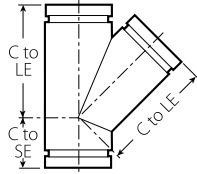
NOTES

- 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).

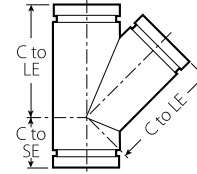
4.6 DIMENSIONS

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
1 ¼ DN32	1.660 42.4	5.75 146	2.50 64	2.5 (d) 1.1
1 ½ 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
2 ½	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
3 ½ 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 49.8
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
14 ² DN350	14.000 355.6	26.50 (sw) 673	7.50 (sw) 191	276.0 125.2
16 ² DN400	16.000 406.4	29.00 (sw) 737	8.00 (sw) 203	344.2 156.1
18 ² DN450	18.000 457.0	32.00 (sw) 813	8.50 (sw) 216	429.0 194.6
20 ² DN500	20.000 508.0	35.00 (sw) 889	9.00 (sw) 229	500.0 226.8
24 ² 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 publication 20.05 			

² 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

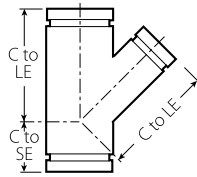
NOTE

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

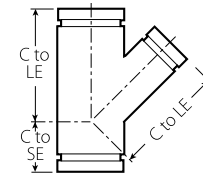
4.7 DIMENSIONS

45° Reducing Lateral

No. 30-R



No. 30-R



No. 30-R

Size			No 30-R 45° Reducing Lateral			Approx. Weight (Each)
Nominal inches DN			C to LE inches mm	C to SE inches mm	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 DN150	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	18.00 457	6.00 152	82.0 37.2
			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
			10 DN250	23.00 584	7.00 178	167.0 75.8

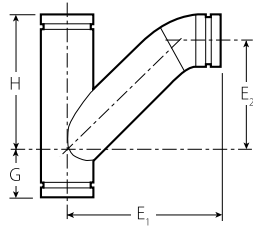
Size			No 30-R 45° Reducing Lateral			Approx. Weight (Each)
Nominal inches DN			C to LE inches mm	C to SE inches mm	lb kg	
14 ² DN350	x	14 DN350	4 DN100	26.50 673	7.50 191	172.0 78.0
			6 DN150	26.50 673	7.50 191	187.0 84.8
			8 DN200	26.50 673	7.50 191	205.8 93.4
			10 DN250	26.20 673	7.50 191	235.0 106.6
			12 DN300	26.50 673	7.50 191	250.0 113.4
			12 DN300	26.50 673	7.50 191	250.0 113.4
16 ² DN400	x	16 DN400	6 DN150	29.00 737	8.00 203	215.0 97.5
			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
			14 DN350	29.00 737	8.00 203	305.0 138.3
18 ² DN450	x	18 DN450	6 DN150	32.00 813	8.50 216	274.0 124.3
			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
			16 DN400	32.00 813	8.50 216	362.0 164.2
20 ² DN500	x	20 DN500	12 DN300	35.00 889	9.00 229	415.0 188.2
			14 DN350	35.00 889	9.00 229	420.0 190.5
			16 DN400	35.00 889	10.00 229	425.0 192.8
			16 DN400	35.00 889	10.00 229	425.0 192.8
24 ² DN600	x	24 DN600	16 DN400	40.00 1016	10.00 254	425.0 192.8
			20 DN600	40.00 1016	10.00 254	570.0 258.6
			20 DN600	40.00 1016	10.00 254	570.0 258.6
14 – 60 DN350 – DN1500			For AGS fitting information, see publication 20.05			

² 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 ₁ inches mm	E ₂ 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

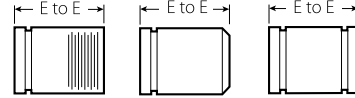
4.9 DIMENSIONS

Adapter Nipple

No. 40¹² 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"/40mm 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"/200mm 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	Actual Outside Diameter	"T" Thickness	Approx. Weight (Each)
inches	inches	inches	lb
DN	mm	mm	kg
¾	1.050	0.88	0.2
DN20	26.9	22	0.1
1	1.315	0.88	0.3
25	33.7	22	0.1
1 ¼	1.660	0.88	0.3
DN32	42.4	22	0.1
1 ½	1.900	0.88	0.5
DN40	48.3	22	0.2
2	2.375	0.88	0.6
DN50	60.3	22	0.3
2 ½	2.875	0.88	1.0
	73.0	22	0.5
DN65	3.000	0.88	1.2
	76.1	22	0.5
3	3.500	0.88	1.2
DN80	88.9	22	0.5
3 ½	4.000	0.88	2.5
DN90	101.6	22	1.1
	4.250	1.00	2.3
	108.0	25	1.0
4	4.500	1.00	2.5
DN100	114.3	25	1.1
	5.250	1.00	4.5
	133.0	25	2.0
DN125	5.500	1.00	4.5
	139.7	25	2.0
5	5.563	1.00	4.6
	141.3	25	2.1

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

² 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

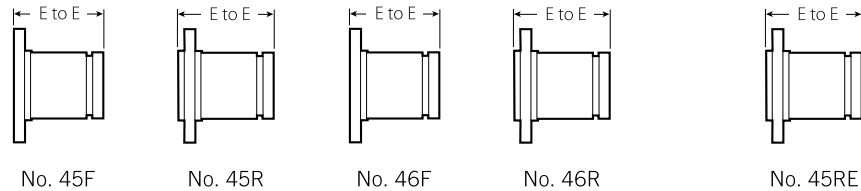
No. 45F ANSI Class 150 Flat Face

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



Size		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
¾ DN20	1.050 26.9	3.00 76	2.3 1.0	3.00 76	3.3 1.5	—	—
1 DN25	1.315 33.7	3.00 76	2.7 1.2	3.00 76	3.9 1.8	—	—
1¼ DN32	1.660 42.4	4.00 102	3.3 1.5	4.00 102	4.8 2.2	—	—
1½ DN40	1.900 48.3	4.00 102	3.9 1.8	4.00 102	6.9 3.1	—	—
2 DN50	2.375 60.3	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	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	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	15.1 6.8	4.00 102	20.1 9.1	—	—
4 DN100	4.500 114.3	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	21.3 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	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	41.3 18.8	6.00 152	70.3 31.9	—	—
10 DN250	10.750 273.0	8.00 203	59.3 27.1	8.00 203	100.8 45.7	—	—
12 DN300	12.750 323.9	8.00 203	40.0 40.0	8.00 203	146.2 66.3	—	—
14 ² DN350	14.000 355.6	8.00 203	+	8.00 203	+	—	—
16 ² DN400	16.000 406.4	8.00 203	+	8.00 203	+	—	—
18 ² DN450	18.000 457.0	8.00 203	+	8.00 203	+	—	—

² 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

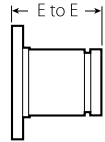
No. 45F ANSI Class 150 Flat Face

No. 45R ANSI Class 150 Raised Face

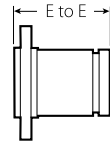
No. 46F ANSI Class 300 Flat Face

No. 46R ANSI Class 300 Raised Face

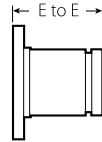
No. 45RE PN10/PN16 Raised Face



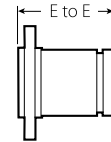
No. 45F



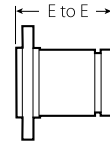
No. 45R




No. 46F



No. 46R



No. 45RE

Size		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
20 ² DN500	20.000 508.0	8.00 203	+	8.00 203	+	—	—
24 ² DN600	24.000 610.0	8.00 203	+	8.00 203	+	—	—
14 – 60 DN350 – DN1500	For AGS fitting information, see publication 20.05 						

² 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).

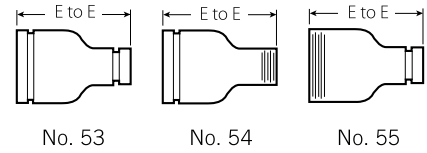
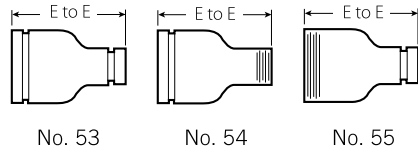
4.12 DIMENSIONS

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
		1 ¼ DN32	6.50 165	2.0 0.9
		1 ½ DN40	6.50 165	2.0 0.9
2 ½	x	1 DN25	7.00 178	3.0 1.4
		1 ¼ DN32	7.00 178	3.0 1.4
		1 ½ 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
		1 ¼ DN32	8.00 203	4.5 2.0
		1 ½ DN40	8.00 203	4.5 2.0
		2 DN50	8.00 203	4.5 2.0
		2 ½	8.00 203	4.5 2.0
3 ½ DN90	x	3 DN80	8.00 203	6.8 3.1
4 DN100	x	1 DN25	9.00 229	7.5 3.4
		1 ¼ DN32	9.00 229	7.5 3.4
		1 ½ DN40	9.00 229	7.5 3.4
		2 DN50	9.00 229	7.5 3.4
		2 ½	9.00 229	7.5 3.4
		3 DN80	9.00 229	7.5 3.4
		3 ½ 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
		1 ¼ DN32	12.00 305	17.0 7.7
		1 ½ DN40	12.00 305	17.2 7.8
		2 DN50	12.00 305	17.4 7.9
		2 ½	12.00 305	17.4 7.9
		3 DN80	12.00 305	17.4 7.9
		3 ½ DN90	12.00 305	17.4 7.9
		4 DN100	12.00 305	17.5 7.9
		4 ½	12.00 305	17.5 7.9
		5	12.00 305	17.5 7.9
		8 DN200	x	6 DN150

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

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details

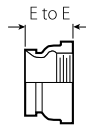
NOTE

- 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
3/4 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
1 1/4 DN32	1.660 42.4	2.31 (sw) 59	1.5 0.7
1 1/2 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
2 1/2	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

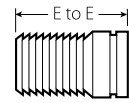
NOTES

- 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
3/4 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
1 1/4 DN32	1.660 42.4	3.88 98	0.6 0.3
1 1/2 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
2 1/2	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

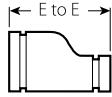
Concentric/Eccentric Reducer

No. 50 Concentric

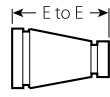
No. 51 Eccentric



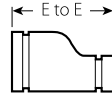
No. 50



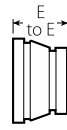
No. 51



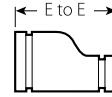
Fabricated Steel
No. 50



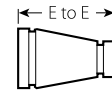
Fabricated Steel
No. 51



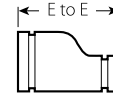
No. 50



No. 51



Fabricated Steel
No. 50



Fabricated Steel
No. 51

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 ¼ DN32 x ¾ DN20	+	1.9 0.9	—	—	—
	1 DN25	+	1.9 0.9	—	—
1 ½ DN40 x ¾ DN20	+	1.4 0.6	—	—	—
	1 DN25	2.50 64	0.8 0.4	8.50 (sw) 216	4.5 2.0
	1 ¼ DN32	2.50 64	1.0 0.5	—	—
2 DN50 x ¾ 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 ¼ DN32	2.50 64	1.2 0.5	9.00 (sw) 229	4.6 2.1
	1 ½ DN40	2.50 64	1.0 0.5	3.50 89	1.1 0.5
2 ½ x ¾ 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 ¼ DN32	3.50 89	3.3 1.5	3.50 89	1.4 0.6
	1 ½ 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 ¾ 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 ¼ DN32	2.50 64	1.4 0.6	+	4.8 2.2
	1 ½ 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 ½	2.50 64	1.8 0.8	3.50 89	7.0 3.2
	DN65	2.50 64	2.1 1.0	—	—
3 ½ 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	—

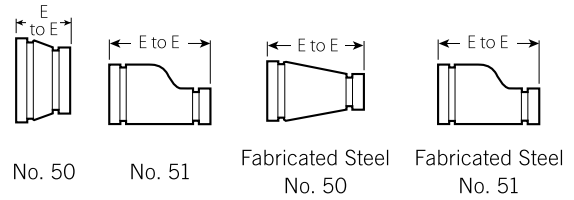
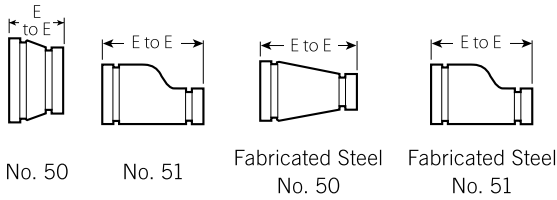
Size	No. 50 Concentric Reducer			No. 51 Eccentric Reducer		
	Nominal inches DN	E to E inches mm	Approx. Weight (Each) lb kg	E to E inches mm	Approx. Weight (Each) lb kg	
1 ¼ DN32 x 1 ½ DN40	+	4.6 2.1	—	—	—	
	2 DN50	3.00 (sw) 76	2.6 1.2	10.00 (sw) 254	8.1 3.7	
	2 ½	3.00 76	2.4 1.1	4.00 102	3.3 1.5	
	3	3.00 76	2.7 1.2	4.00 102	3.4 1.5	
	3 ½ DN80	3.00 76	3.2 1.4	4.00 102	3.5 1.6	
	4	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 ½	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 ½ DN40	+	5.5 2.5	+	+	
	2 DN50	4.00 102	6.6 3.0	11.50 (sw) 292	14.5 6.6	
	2 ½	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	
8 DN200 x 2 ½ DN80	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 x	4 DN100	19.7 8.9	13.00 (sw) 330	32.0 14.5	
	5	33.0 15.0	+	34.6 15.7	
	6 DN150	20.0 9.1	13.00 (sw) 330	36.9 16.7	
	8 DN200	22.0 10.0	7.00 178	21.6 9.8	
12 DN300 x	4 DN100	44.0 20.0	14.00 (sw) 356	48.0 21.8	
	6 DN150	24.6 11.2	14.00 (sw) 356	50.0 22.7	
	8 DN200	52.0 23.6	14.00 (sw) 356	53.5 24.3	
	10 DN250	39.0 17.7	14.00 (sw) 356	57.0 25.9	
14 ² DN350 x	6 DN150	65.0 29.5	13.00 330	60.0 27.2	
	8 DN200	65.0 29.5	13.00 330	60.0 27.2	
	10 DN250	66.0 29.9	13.00 330	65.0 29.5	
	12 DN300	68.0 30.8	13.00 330	66.0 29.9	
16 ² DN400 x	8 DN200	73.0 33.1	14.00 355	73.0 33.1	
	10 DN250	73.0 33.1	14.00 355	73.0 33.1	
	12 DN300	73.0 33.1	14.00 355	73.0 33.1	
	14 DN350	73.0 33.1	14.00 355	73.0 33.1	
18 ² DN450 x	10 DN250	91.0 41.3	15.00 381	91.0 41.3	
	12 DN300	91.0 41.3	15.00 381	91.0 41.3	
	14 DN350	91.0 41.3	15.00 381	91.0 41.3	
	16 DN400	91.0 41.3	15.00 381	91.0 41.3	

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 ² DN500 x	10 DN250	110.0 49.9	20.00 508	20.00 508	177.0 80.3
	12 DN300	120.0 54.4	20.00 508	20.00 508	120.0 54.4
	14 DN350	149.0 67.9	20.00 508	20.00 508	149.0 67.9
	16 DN400	120.0 54.4	20.00 508	20.00 508	120.0 54.4
	18 DN450	136.0 61.7	20.00 508	20.00 508	136.0 61.7
	24 ² DN600 x	10 DN250	142.0 64.4	20.00 508	20.00 508
	12 DN300	150.0 68.0	20.00 508	20.00 508	150.0 68.0
	14 DN350	162.0 73.5	20.00 508	20.00 508	162.0 73.5
	16 DN400	162.0 73.5	20.00 508	20.00 508	162.0 73.5
	18 DN450	162.0 73.5	20.00 508	20.00 508	162.0 73.5
	20 DN500	151.0 68.5	20.00 508	20.00 508	190.0 86.2
14 – 60 DN350 – DN1500		For AGS fitting information, see publication 20.05			



² 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).

² 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.

4.16 DIMENSIONS

Small Threaded Reducer

No. 52

No. 52F



No. 52



No. 52F



No. 52



No. 52F

Size		No. 52 Small Threaded 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	1 DN25	2.50 64	0.8 0.4	—	—
	1¼ DN32	2.50 64	0.9 0.4	—	—
2 DN50	¾ DN20	2.50 64	0.9 0.4	—	—
	1 DN25	2.50 64	0.7 0.3	—	—
	1¼ DN32	2.50 64	1.2 0.5	—	—
	1½ DN40	2.50 64	1.0 0.5	—	—
2½	1 DN25	2.50 64	1.1 0.5	—	—
	1¼ DN32	2.50 (sw) 64	1.2 0.5	—	—
	1½ DN40	2.50 (sw) 64	1.3 0.6	—	—
	2 DN50	2.50 64	1.4 0.6	—	—
DN65	1½ DN40	64	0.8	64	0.8
	2 DN50	—	—	64	0.9
3 DN80	¾ DN20	+(sw)	1.5 0.7	—	—
	1 DN25	2.50 64	1.3 0.6	—	—
	1¼ DN32	2.50 64	1.5 0.7	—	—
	1½ DN40	2.50 (sw) 64	1.5 0.7	—	—
	2 DN50	2.50 64	1.5 0.7	—	—
	2½	2.50 64	2.4 1.1	—	—
88.9mm	42.4mm	64	0.9	64	0.8
	48.3mm	64	0.9	64	0.9
	60mm	—	—	64	0.9

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

(sw) = Carbon Steel Segmentally Welded

+ Contact Victaulic for details.

Size		No. 52 Small Threaded 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	1 DN25	3.00 76	2.3 1.0	—	—
	1½ DN40	3.00 76	2.7 1.2	—	—
	2 DN50	3.00 76	2.6 1.2	—	—
	2½	3.00 76	2.6 1.2	—	—
	3 DN80	3.00 76	2.5 1.1	—	—
108.0mm	42.4mm	76	1.3	76	1.3
	48.3mm	76	1.3	76	1.4
	60mm	—	—	76	1.4
114.3mm	42.4mm	76	1.3	76	1.3
	48.3mm	76	1.3	76	1.3
	60mm	76	1.3	76	1.4
5	4 DN100	+	4.5 2.0	—	—
133.0mm	60mm	—	—	114	2.2
139.0mm	60mm	—	—	114	2.3
6 DN150	1 DN25	4.00 102	5.5 2.5	—	—
	2 DN50	4.00 102	5.7 2.6	—	—
	2½	4.00 102	5.8 2.6	—	—
	3 DN80	4.00 102	5.8 2.6	—	—
	4 DN100	+(sw)	6.5 2.9	—	—
159.0mm	42.4mm	114	2.2	144	2.5
	48.3mm	114	2.2	114	2.5
	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	48.3mm	102mm	2.4	102	2.9
	60mm	—	—	102	3.0
	—	—	—	—	—
8 DN200 x 2 DN50	2 ½	16.00 406	1.5 0.7	—	—
	—	—	—	—	—

(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 ⁴ 7.5	15.8 4.8	18.5 ⁴ 5.6	11.0 3.4	70.0 21.3	23.0 7.0
16 DN400	16.000 406.4	28.0 ⁴ 8.5	18.0 5.5	21.0 ⁴ 6.4	13.0 4.0	80.0 24.4	27.0 8.2
18 DN450	18.000 457.0	31.0 ⁴ 9.5	20.0 6.1	23.5 ⁴ 7.2	14.0 4.3	90.0 27.4	30.0 9.1
20 DN800	20.000 508.0	34.0 ⁴ 10.4	22.5 6.9	25.5 ⁴ 7.8	16.0 4.9	100.0 30.5	33.0 10.1
24 DN600	24.000 610.0	42.0 ⁴ 12.8	27.0 8.2	29.5 ⁴ 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.



⁴ 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](#).

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.

Warranty

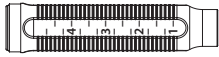
Refer to the Warranty section of the current Price List or contact Victaulic for details.

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.

4.1 DIMENSIONS (CONTINUED)

Standard Reducer

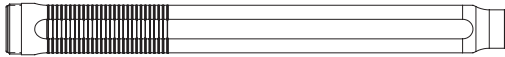


5.75"/140 mm straight reducer

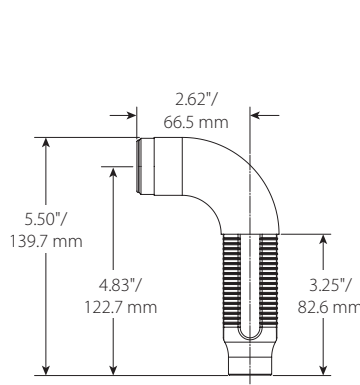
Optional Reducers



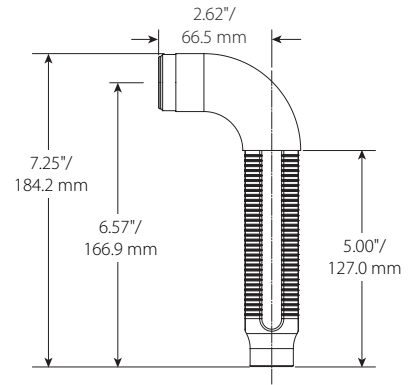
9.0"/229 mm straight reducer



13.0"/330 mm straight reducer



Short 90° elbow reducer

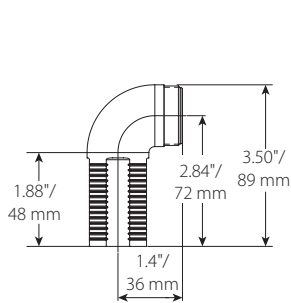


Long 90° elbow reducer

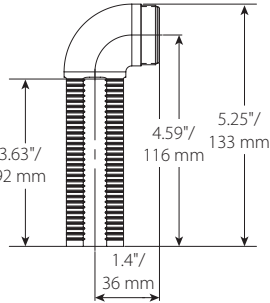
NOTE

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

Low Profile



Short 90° elbow reducer

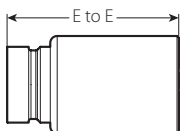


Long 90° elbow reducer

NOTE

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

No. 116 CPVC Adapter



NOTES

- E to E is 3.0"/76.0 mm
- The No. 116 CPVC Adapters have 2 ft (0.6 m). EQL of 1" Schedule 40 pipe

Elbow & Tee (Class 300 XS/XH)

- Fig. 1164** Straight Tee
- Fig. 1170** 90° Street Elbow



Fig. 1164



Fig. 1170



ASC Engineered Solutions™ offers the broadest line of malleable iron fitting sizes in both black and galvanized finishes. Every fitting is manufactured and tested to meet ASC's strict quality standards. All Anvil Class 300 Malleable Iron Fittings conform to ASME B16.3 and unions conform to ASME B16.39. All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar). For Listings/Approval Details and Limitations, visit our website at www.asc-es.com or contact an ASC Engineered Solutions™ Representative. See following page for standards and specifications.

Malleable Iron Threaded Pipe Unions Pressure - Temperature Ratings

Temperature	Pressure		
	Class 150	Class 250	Class 300
	PSI/bar	PSI/bar	PSI/bar
-20°–150°	300	500	600
-28.9°–65.6°	20.7	34.5	41.4
200°	265	455	550
93.3°	18.3	31.4	37.9
250°	225	405	505
121.1°	15.5	27.9	34.8
300°	185	360	460
148.9°	12.8	24.8	31.7
350°	150	315	415
176.7°	10.3	21.7	28.6
400°	110	270	370
204.4°	7.6	18.6	25.5
450°	75	225	325
232.2°	5.2	15.5	22.4
500°	–	180	280
260.0°	–	12.4	19.3
550°	–	130	230
287.8°	–	9.0	15.9

Malleable Iron Threaded Fittings Pressure - Temperature Ratings

Temperature	Pressure Class 300			
	Class 150	Sizes 1/4"-1" (6-25mm)	Sizes 1 1/4"-2" (32-51mm)	Sizes 2 1/2"-3" (64-76mm)
	PSI/bar	PSI/bar	PSI/bar	PSI/bar
-20°–150°	300	2000	1500	1000
-28.9°–65.6°	20.7	137.9	103.4	68.9
200°	265	1785	1350	910
93.3°	18.3	123.1	93.1	62.7
250°	225	1575	1200	825
121.1°	15.5	108.6	82.7	56.9
300°	185	1360	1050	735
148.9°	12.8	93.8	72.4	50.7
350°	150	1150	900	650
176.7°	10.3	79.3	62.1	44.8
400°	–	935	750	560
204.4°	–	64.5	51.7	38.6
450°	–	725	600	475
232.2°	–	50.0	41.4	32.8
500°	–	510	450	385
260.0°	–	35.2	31.0	26.5
550°	–	300	300	300
287.8°	–	20.7	20.7	20.7

Note:
Unions with Copper or Copper Alloy seats are not intended for use where temperature exceeds 450°F.



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:	

Elbow & Tee (Class 300 XS/XH) Fig. 1164, 1170



Standards and Specifications

Malleable Iron Fittings

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
Class 150/PN 20	ASME B16.3	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.3
Class 300/PN 50	ASME B16.3	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.3

Malleable Iron Unions

	Dimensions	Material	Galvanizing*	Thread	Pressure Rating
Class 150/PN 20	ASME B16.39	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.39
Class 250	ASME B16.39	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.39
Class 300/PN 50	ASME B16.39	ASTM A197	ASTM A153	ASME B1 20.1	ASME B16.39

Note:

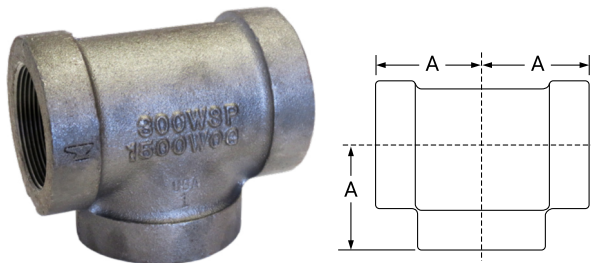
* ASTM B633, Type I, SC 4, may be supplied as alternate zinc coating per applicable ASME B16 product standard.



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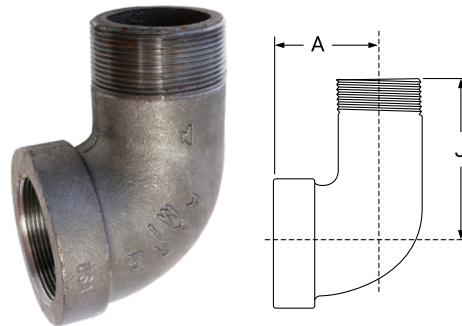
Building connections that last™

Fig. 1164
Straight Tee



Size NPS/DN	Center to End A In./mm	Unit Weight	
		Black Lbs./kg	Galvanized Lbs./kg
1/4 8	15/16 33	0.27 0.12	0.27 0.12
3/8 10	1 1/16 27	0.42 0.19	0.42 0.19
1/2 15	1 1/4 32	0.65 0.29	0.65 0.29
3/4 20	1 7/16 37	1.07 0.49	1.07 0.49
1 25	1 5/8 41	1.62 0.73	1.62 0.73
1 1/4 32	1 15/16 49	2.49 1.13	2.49 1.13
1 1/2 40	2 1/8 54	3.40 1.54	3.40 1.54
2 50	2 1/2 64	5.20 2.36	5.20 2.36
2 1/2 65	2 15/16 75	7.87 3.57	7.87 3.57
3 80	3 3/8 86	12.46 5.65	12.46 5.65
4 100	4 1/2 114	24.02 10.89	24.02 10.89

Fig. 1170
90° Street Elbow



Size NPS/DN	A In./mm	J In./mm	Unit Weight	
			Black Lbs./kg	Galvanized Lbs./kg
1/4 8	15/16 24	17/16 37	0.17 0.08	0.17 0.08
3/8 10	1 1/16 27	1 5/8 41	0.26 0.12	0.26 0.12
1/2 15	1 1/4 32	2 51	0.40 0.18	0.40 0.18
3/4 20	1 7/16 37	2 3/16 56	0.68 0.31	0.68 0.31
1 25	1 5/8 41	2 9/16 65	1.04 0.47	1.04 0.47
1 1/4 32	1 15/16 49	2 7/8 73	1.60 0.73	1.60 0.73
1 1/2 40	2 1/8 54	3 1/8 79	2.20 1.00	2.20 1.00
2 50	2 1/2 64	3 11/16 94	3.59 1.63	3.59 1.63
3 80	3 3/8 86	5 1/8 130	9.55 4.33	— —

Notes:

See first page for pressure-temperature ratings. Galvanized weights may vary. Please contact your ASC Engineered Solutions™ Representative if you need verification.

All elbows and tees 3/8" (10 DN) and larger are 100% gas tested at a minimum of 100 PSI (6.9 bar).



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Building connections that last™

Fig. 1164, 1170 Elbow & Tee (Class 300 XS/XH)

General Assembly of Threaded Fittings

1 Inspect both male and female components prior to assembly.

- Threads should be free from mechanical damage, dirt, chips and excess cutting oil.
- Clean or replace components as necessary.

2 Application of thread sealant

- Use a thread sealant that is fast drying, sets-up to a semi hard condition and is vibration resistant. Alternately, an anaerobic sealant may be utilized.
- Thoroughly mix the thread sealant prior to application.
- Apply a thick even coat to the male threads only. Best application is achieved with a brush stiff enough to force sealant down to the root of the threads.

3 Joint Makeup

- For sizes up to and including 2" pipe, wrench tight makeup is considered three full turns past handtight. Handtight engagement for ½" through 2" thread varies from 4½ turns to 5 turns.
- For 2½" through 4" sizes, wrench tight makeup is considered two full turns past handtight. Handtight engagement for 2½" through 4" thread varies from 5½ turns to 6¾ turns.



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Building connections that last™

Fire Sprinkler Pipe

Schedule 10 and Schedule 40

Submittal Data Sheet



SCHEDULE 10 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT. lbs.	WT./FT. H ₂ O FILLED lbs.	PCS./LIFT	WT./LIFT 21' lbs.	WT./LIFT 24' lbs.	WT./LIFT 25' lbs.	UL CRR*
	in.	mm	in.	mm	in.	mm							
1	1.315	33.4	1.097	27.9	0.109	2.77	1.405	1.814	70	2065	2360	2459	11.4
1¼	1.660	42.2	1.442	36.6	0.109	2.77	1.807	2.514	61	2315	2645	2756	7.3
1½	1.900	48.3	1.682	42.7	0.109	2.77	2.087	3.049	61	2673	3055	3183	5.8
2	2.375	60.3	2.157	54.8	0.109	2.77	2.640	4.222	37	2051	2344	2442	4.7
2½	2.875	73.0	2.635	66.9	0.120	3.05	3.354	5.895	30	2226	2544	2651	3.5
3	3.500	88.9	3.260	82.8	0.120	3.05	4.336	7.949	19	1730	1977	2060	2.6
4	4.500	114.3	4.260	108.2	0.120	3.05	5.619	11.789	19	2242	2562	2669	1.6
5	5.563	141.3	5.295	134.5	0.134	3.40	7.780	17.309	13	2124	2427	2529	1.5
6	6.625	168.3	6.357	161.5	0.134	3.40	9.298	23.038	10	1953	2232	2325	1.0
8	8.625	219.1	8.249	209.5	0.188	4.78	16.960	40.086	7	2493	2849	2968	2.1

SCHEDULE 40 WEIGHTS AND DIMENSIONS

NPS	NOMINAL OD		NOMINAL ID		NOMINAL WALL		WT./FT. lbs.	WT./FT. H ₂ O FILLED lbs.	PCS./LIFT	WT./LIFT 21' lbs.	WT./LIFT 24' lbs.	WT./LIFT 25' lbs.	UL CRR*
	in.	mm	in.	mm	in.	mm							
1	1.315	33.4	1.049	26.6	0.133	3.38	1.68	2.055	70	2470	2822	2940	1.000
1¼	1.660	42.2	1.380	35.1	0.140	3.56	2.27	2.922	51	2431	2778	2894	1.000
1½	1.900	48.3	1.610	40.9	0.145	3.68	2.72	3.602	44	2513	2872	2992	1.000
2	2.375	60.3	2.067	52.5	0.154	3.91	3.66	5.109	24	1845	2108	2196	1.000
2½	2.875	73.0	2.469	62.7	0.203	5.16	5.80	7.871	20	2436	2784	2900	1.000
3	3.500	88.9	3.068	77.9	0.216	5.49	7.58	10.783	13	2069	2365	2464	1.000
3½	4.000	101.6	3.548	90.1	0.226	5.74	9.12	13.400	10	1915	2189	2280	1.000
4	4.500	114.3	4.026	102.3	0.237	6.02	10.80	16.311	10	2268	2592	2700	1.000
5	5.563	141.3	5.047	128.2	0.258	6.55	14.63	23.262	7	2151	2458	2560	1.000
6	6.625	168.3	6.065	154.1	0.280	7.11	18.99	31.498	5	1994	2279	2374	1.000
8**	8.625	219.1	7.981	202.7	0.322	8.18	28.58	50.240	5	3001	3430	3573	1.000

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

** 8 NPS Schedule 40 is FM Approved but not UL Listed.



WFS-060520



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Beam Clamps

TOLCO™ Fig. 65 - Reversible Steel C-Type Beam Clamp 3/4" (19.0mm) Throat Opening

Size Range:

Fig. 65 - 1/2"-13 rod sizes, and 5/8"-11 rod sizes
 Fig. 65XT - 3/8"-16 rod size (see below)

Material: Steel with hardened cup point set screw and jam nut

Function: Recommended for hanging from steel beam where flange thickness does not exceed 3/4" (19.0mm).

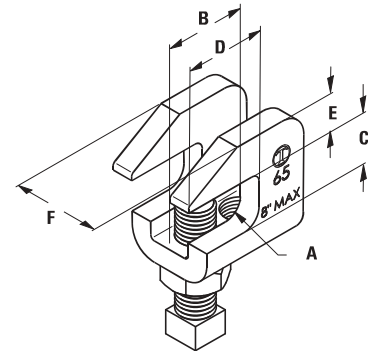
Features: All steel construction eliminates structural deficiencies associated with casting type beam clamps. May be used on top or bottom flange of beam. (Beveled lip allows hanging from top flange where clearance is limited.) May be installed with set screw in up or down position. Offset design permits unlimited rod adjustment by allowing the rod to be threaded completely through the clamp. Open design permits inspection of thread engagement.

Approvals: Underwriters Laboratories Listed in the USA (UL) and Canada (cUL). Exceeds requirements of the National Fire Protection Association (NFPA), pamphlet 13, 3/8"-16 rod will support 1/2" (15mm) thru 4" (100mm) pipe
 1/2"-13 rod will support thru 8" (200mm) pipe

Finish: Plain or Electro-Galvanized. Contact customer service for alternative finishes and materials.

Order By: Figure number and finish

Fig. 65 Patent #4,570,885



Set Screw and Locknut Included



Part No.	Rod Size A	B in. (mm)	C in. (mm)	D in. (mm)	E in. (mm)
65-1/2	1/2"-13	1 1/2" (38.1)	3/4" (19.0)	1" (25.4)	9/16" (14.3)
65-5/8	5/8"-11	1 1/2" (38.1)	3/4" (19.0)	1" (25.4)	9/16" (14.3)

Part No.	F in. (mm)	Approx. Wt./100 Lbs. (kg)
65-1/2	1 1/4" (31.7)	55 (24.9)
65-5/8	1 1/4" (31.7)	55 (24.9)

Beam Clamps

TOLCO™ Fig. 65XT - Reversible Steel C-Type Beam Clamp 3/4" (19.0mm) Throat Opening

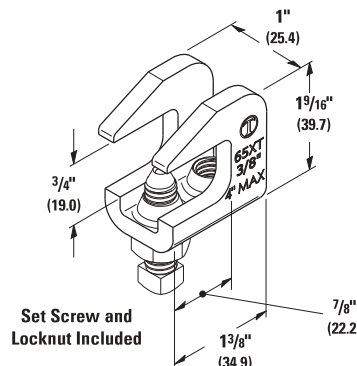
Feature: Extruded holes allows for more thread engagement of threaded rod and set screw.

Finish: Plain or Electro-Galvanized

Order By: Figure number and finish

Approvals: Underwriters Laboratories Listed (cULus) and FM Approved (FM) for up to 4" (100mm) pipe.

Designed to meet or exceed requirements of FM DS 2-0 and NFPA 13.



Set Screw and Locknut Included



Part No.	For Rod Size	Approx. Wt/100 Lbs. (kg)
65XT	3/8"-16	28.0 (12.7)

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



The following excerpt are pages from the North American Product Technical Guide, Volume 2: Anchor Fastening, Edition 21.

Please refer to the publication in its entirety for complete details on this product including data development, product specifications, general suitability, installation, corrosion and spacing and edge distance guidelines.

US&CA: <https://submittals.us.hilti.com/PTGVol2/>

To consult directly with a team member regarding our anchor fastening products, contact Hilti's team of technical support specialists between the hours of 7:00am – 6:00pm CST.



US: 877-749-6337 or HNATechnicalServices@hilti.com

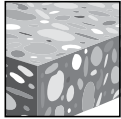
CA: 1-800-363-4458, ext. 6 or CATechnicalServices@hilti.com

3.3.12 HDI+, HDI-L+, AND HDI DROP IN ANCHORS

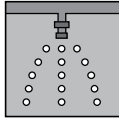
PRODUCT DESCRIPTION

HDI+, HDI-L+, and HDI Drop-in anchors

Anchor System	Features and Benefits
 <p>HDI-L+ and HDI+ with Auto setting tools 1/4" to 1/2"</p>	<ul style="list-style-type: none"> Anchor, setting tool and Hilti drill bit form a matched tolerance system to provide reliable fastenings Allows shallow embedment without sacrificing performance Lip allows accurate flush surface setting, independent of hole depth for the HDI-L+ Ideal for repetitive fastenings with threaded rods of equal length HDI+ and HDI-L+ have an innovative stepped plug that reduces number of hammer blows by up to 50%
 <p>HDI and Manual setting tool 5/8" to 3/4" HDI SS303 1/4" to 3/4" HDI-S 1/2" and 3/4"</p>	<ul style="list-style-type: none"> HDI+ and HDI-L+ can be installed with the new HDI+ Setting Tool system (stop drill bit and machine setting tool) for improved productivity HDI-S speed thread designed to accept coil rods and forms a matched tolerance system for forming applications.



Uncracked concrete



Fire sprinkler listings

Approvals/Listings	
FM (Factory Mutual)	Pipe hanger components for automatic sprinkler systems HDI+ 3/8, HDI-L+ 3/8, HDI+1/2, HDI-L+ 1/2, HDI 5/8 and HDI 3/4
UL and cUL (Underwriters Laboratory)	Pipe hanger equipment for fire protection services HDI+ 3/8, HDI-L+ 3/8, HDI+1/2, HDI-L+ 1/2, HDI 5/8 and HDI 3/4

3.3.12



INSTALLATION PARAMETERS

Table 1 — Hilti HDI+, HDI-L+HDI, HDI-SS303 and HDI-S specifications

Setting Information	Symbol	Units	HDI+, HDI-L+ and HDI-SS303			HDI and HDI-SS303		HDI-S	
			1/4	3/8	1/2	5/8	3/4	1/2	3/4
Insert thread	d	UNC	1/4-20	3/8-16	1/2-13	5/8-11	3/4-10	1/2-6	3/4-4.5
Nominal bit diameter	d _{bit}	in.	3/8	1/2	5/8	27/32	1	5/8	1
Nominal embedment	h _{nom}	in.	1	1-9/16	2	2-9/16	3-3/16	2	3-3/16
Anchor length	ℓ	(mm)	(25)	(40)	(51)	(65)	(81)	(51)	(81)
Hole depth	h _o								
Useable thread length	ℓ _{th}	in. (mm)	7/16 (11)	5/8 (15)	11/16 (17)	7/8 (22)	1-3/8 (34)	11/16 (17)	1-3/8 (34)
Installation torque	T _{inst}	ft-lb (Nm)	4 (5)	11 (15)	22 (30)	37 (50)	80 (109)	22 (30)	80 (109)
Minimum slab thickness	h	in. (mm)	3 (76)	3-1/8 (79)	4 (102)	5-1/8 (130)	6-3/8 (162)	4 (102)	6-3/8 (162)

MATERIAL SPECIFICATIONS

HDI+, HDI-L, HDI and HDI-S anchors are manufactured from mild carbon steel. Anchor bodies are zinc plated in accordance with ASTM B633, AC 1, Type III

HDI SS303 anchors are manufactured from AISI Type 303 stainless steel

DESIGN DATA IN CONCRETE USING ALLOWABLE STRESS DESIGN

Table 2 — Hilti HDI+, HDI-L+ and HDI carbon steel allowable loads in concrete^{1,2}

Anchor type	Nominal anchor diameter in.	$f'_c = 2,000$				$f'_c = 4,000$				$f'_c = 6,000$			
		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)	
HDI+	1/4	385	(1.7)	450	(2.0)	510	(2.3)	625	(2.8)	640	(2.8)	700	(3.1)
	3/8	635	(2.8)	965	(4.3)	920	(4.1)	1,250	(5.6)	1,260	(5.6)	1,500	(6.7)
	1/2	945	(4.2)	1,500	(6.7)	1,605	(7.1)	2,125	(9.5)	1,950	(8.7)	2,500	(11.1)
HDI	5/8	1,875	(8.3)	2,500	(11.1)	2,920	(13.0)	3,250	(14.5)	3,715	(16.5)	3,750	(16.7)
	3/4	2,500	(11.1)	3,875	(17.2)	4,065	(18.1)	5,000	(22.2)	5,565	(24.8)	5,500	(24.5)

Table 3 — Hilti HDI+, HDI-L+ and HDI carbon steel ultimate loads in concrete¹

Anchor type	Nominal anchor diameter in.	$f'_c = 2,000$				$f'_c = 4,000$				$f'_c = 6,000$			
		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)	
HDI+	1/4	1,535	(6.8)	1,800	(8.0)	2,040	(9.1)	2,500	(11.1)	2,555	(11.4)	2,800	(12.5)
	3/8	2,540	(11.3)	3,850	(17.1)	3,685	(16.4)	5,000	(22.2)	5,035	(22.4)	6,000	(26.7)
	1/2	3,780	(16.8)	6,000	(26.7)	6,425	(28.6)	8,500	(37.8)	7,810	(34.7)	10,000	(44.5)
HDI	5/8	7,500	(33.4)	10,000	(44.5)	11,685	(52.0)	13,000	(57.8)	14,865	(66.1)	15,000	(66.7)
	3/4	10,000	(44.5)	15,500	(68.9)	16,260	(72.3)	20,000	(89.0)	22,250	(99.0)	22,000	(97.9)

1 The shear tests were conducted with SAE Grade 5 bolts with minimum yield strength of 85 ksi and minimum tension strength of 120 ksi. Shear testing for the 1/4-in. models were conducted with SAE Grade 8 bolts with minimum yield strength of 120 ksi and minimum tension strength of 150 ksi in 6,000 psi concrete. High-strength bolts were used to force concrete failure modes. When using steel bolts with a lower tensile strength, steel failure must be considered.

2 Allowable loads calculated with a factor of safety of 4.

Table 4 — Hilti HDI+, HDI-L+ and HDI carbon steel allowable loads in lightweight concrete and lightweight concrete poured over metal deck^{1,2,3,4}

Anchor type	Nominal anchor diameter in.	3,000 psi lightweight concrete over metal deck											
		3,000 psi lightweight concrete				Upper flute				Lower flute			
		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)	
HDI+	1/4	465	(2.1)	340	(1.5)	530	(2.4)	335	(1.5)	375	(1.7)	250	(1.1)
	3/8	720	(3.2)	940	(4.2)	810	(3.6)	1,010	(4.5)	500	(2.2)	500	(2.2)
	1/2	1,035	(4.6)	1,700	(7.6)	1,035	(4.6)	1,755	(7.8)	625	(2.8)	750	(3.3)
HDI	5/8	1,465	(6.5)	2,835	(12.6)	1,035	(4.6)	1,755	(7.8)	875	(3.9)	875	(3.9)
	3/4	2,075	(9.2)	3,680	(16.4)	1,250	(5.6)	1,755	(7.8)	1,250	(5.6)	1,000	(4.4)

1 The shear tests were conducted with SAE Grade 5 bolts with minimum yield strength of 85 ksi and minimum tension strength of 120 ksi. Shear testing for the 1/4-in. models were conducted with SAE Grade 8 bolts with minimum yield strength of 120 ksi and minimum tension strength of 150 ksi in 6,000 psi concrete. High-strength bolts were used to force concrete failure modes. When using steel bolts with a lower tensile strength, steel failure must be considered.

2 Minimum compressive strength of structural lightweight concrete is 3,000 psi.

3 See figure 1 for typical details.

4 Allowable loads calculated with a factor of safety of 4.

Table 5 — Hilti HDI stainless steel allowable loads in concrete^{1,2}

Nominal anchor diameter in.	$f'_c = 4,000$				$f'_c = 6,000$			
	Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)	
1/4	480	(2.1)	600	(2.7)	740	(3.3)	600	(2.7)
3/8	1,040	(4.6)	1,230	(5.5)	1,460	(6.5)	1,230	(5.5)
1/2	1,840	(8.2)	2,760	(12.3)	2,410	(10.7)	2,760	(12.3)
5/8	2,630	(11.7)	4,510	(20.1)	3,770	(16.8)	4,510	(20.1)
3/4	3,830	(17.0)	5,580	(24.8)	5,030	(22.4)	5,580	(24.8)

1 Shear testing conducted with 18-8 stainless steel bolts.

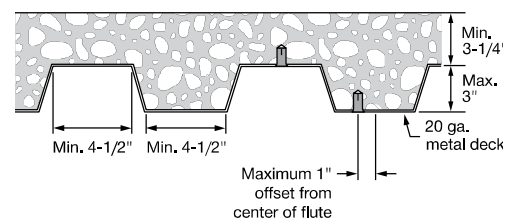
2 Allowable loads calculated with a factor of safety of 4.

Table 6 — Hilti HDI-S speed thread allowable loads in concrete¹

Nominal anchor diameter in.	$f'_c = 4,000$				$f'_c = 6,000$			
	Tension, lb (kN)		Shear, lb (kN)		Tension, lb (kN)		Shear, lb (kN)	
1/2	1,785	(7.9)	1,570	(7.0)	2,345	(10.4)	1,570	(7.0)
3/4	4,065	(18.1)	3,700	(16.5)	5,565	(24.8)	3,700	(16.5)

1 Allowable loads calculated with a factor of safety of 4.

Figure 1 — Installation of Hilti HDI+ and HDI drop-in anchor in the soffit of concrete over metal deck floor and roof assemblies W-deck



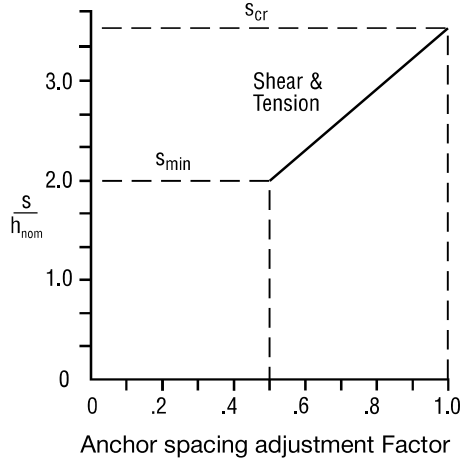
Combined shear and tension loading

$$\left(\frac{N_d}{N_{rec}} \right)^{5/3} + \left(\frac{V_d}{V_{rec}} \right)^{5/3} \leq 1.0$$

Anchor spacing and edge distance guidelines

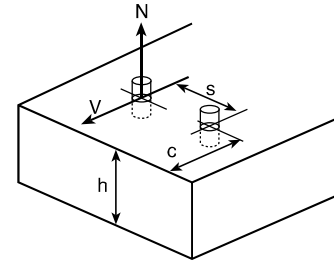
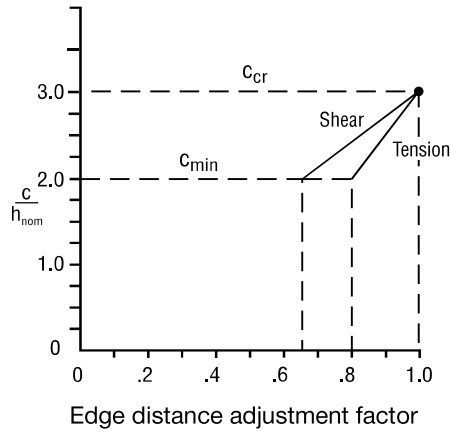
Anchor spacing adjustment factors

s = Actual Spacing
 $s_{min} = 2.0 h_{nom}$
 $s_{cr} = 3.5 h_{nom}$



Edge distance adjustment factors

c = Actual edge distance
 $c_{min} = 2.0 h_{nom}$
 $c_{cr} = 3.0 h_{nom}$



Influence of anchor spacing and edge distance f_A and f_R

Anchor Size		h_{nom}	
in.	(mm)	in.	(mm)
1/4	(6.4)	1	(25)
3/8	(9.5)	1-9/16	(40)
1/2	(12.7)	2	(51)
5/8	(15.8)	2-9/16	(65)
3/4	(19.1)	3-3/16	(81)

h_{nom} = nominal embedment depth

Table 7 — Load adjustment factors for Hilti HDI drop-in anchors in concrete

Load adjustment factors for anchor spacing f_A							Load adjustment factors for edge distance f_R											
Tension/shear loads							Tension f_{RN}						Shear f_{RV}					
Spacing s		Anchor diameter					Edge distance c		Anchor diameter				Anchor diameter					
in.	(mm)	1/4	3/8	1/2	5/8	3/4	in.	(mm)	1/4	3/8	1/2	5/8	3/4	1/4	3/8	1/2	5/8	3/4
2	(51)	.50					2	(51)	.80					.65				
2-1/2	(64)	.67					2-1/2	(64)	.90					.83				
3	(76)	.83	.50				3	(76)	1.0	.80				1.0	.65			
3-1/2	(89)	1.0	.58				3-1/2	(89)		.85					.73			
4	(102)		.69	.50			4	(102)		.91	.80				.85	.65		
4-1/2	(114)		.79	.58			4-1/2	(114)		.98	.85				.96	.74		
5	(127)		.90	.67	.50		5	(127)		1.0	.90	.80			1.0	.83	.65	
5-1/2	(140)		1.0	.75	.55		5-1/2	(140)			.95	.83				.91	.70	
6	(152)			.83	.61	.50	6	(152)			1.0	.87				1.0	.77	
7	(178)			1.0	.74	.57	6-1/2	(165)				.91	.80				.84	.65
8	(203)				.87	.67	7	(178)				.95	.84				.91	.72
9	(229)				1.0	.77	8	(203)				1.0	.90				1.0	.83
10	(254)					.88	9	(229)					.96					.94
11	(279)					.98	10	(254)					1.0					1.0
12	(305)					1.0												

$s_{min} = 2.0 h_{nom}$ $s_{cr} = 3.5 h_{nom}$ $f_A = 0.33 \frac{s}{h_{nom}} - 0.17$ for $s_{cr} > s > s_{min}$	$c_{min} = 2.0 h_{nom}$ $c_{cr} = 3.0 h_{nom}$ $f_{RN} = 0.2 \frac{c}{h_{nom}} + 0.4$ for $c_{cr} > c > c_{min}$	$c_{min} = 2.0 h_{nom}$ $c_{cr} = 3.0 h_{nom}$ $f_{RV} = 0.35 \frac{c}{h_{nom}} - 0.05$ for $c_{cr} > c > c_{min}$
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3.3.12

INSTALLATION INSTRUCTIONS

Manufacturer's Printed Installation Instructions (MPII) are included with each product package. They can also be viewed or downloaded at www.hilti.com. Because of the possibility of changes, always verify that downloaded MPII are current when used. Proper installation is critical to achieve full performance. Training is available on request. Contact Hilti Technical Services for applications and conditions not addressed in the MPII.

ORDERING INFORMATION¹

HDI+, HDI-L+ and HDI

Carbon steel

Description	Description	Description	Anchor thread size	Qty / box
HDI+ 1/4	HDI-L+ 1/4	-	1/4	100
HDI+ 3/8	HDI-L+ 3/8	-	3/8	50
HDI+ 1/2	HDI-L+ 1/2	HDI-S 1/2"	1/2	50
HDI 5/8	-	-	5/8	25
HDI 3/4	-	HDI-S 3/4"	3/4	25

HDI-SS303 anchors

Stainless steel

Description	Anchor thread size	Qty / box
HDI 1/4 SS303	1/4	100
HDI 3/8 SS303	3/8	50
HDI 1/2 SS303	1/2	50
HDI 5/8 SS303	5/8	25
HDI 3/4 SS303	3/4	25

Setting Tools for HDI+ and HDI-L+

Anchor thread size	Description
1/4	HST 1/4 Setting tool
	HSD-MM 1/4 (TE-C-24D6 1/4 Setting tool)
	HDI+ Setting Tool includes a TE-CX 3/8x1 carbide bit
3/8	HST 3/8 Setting tool
	HSD-MM 3/8 (TE-C-24SD10 3/8 Setting tool)
	HDI+ Setting Tool includes a TE-CX 1/2x1-9/16 carbide bit
1/2	HST 1/2 Setting tool
	HSD-MM 1/2 (TE-C-24SD12 1/2 Setting tool)
	HDI+ Setting Tool includes a TE-CX 5/8x2 carbide bit



Setting tools for HDI and HDI-SS303 anchors

Description	Sets anchor size	Qty
HST 1/4" Hand Setting Tool	1/4" HDI SS303	1
HST 3/8" Hand Setting Tool	3/8" HDI SS303	1
HST 1/2" Hand Setting Tool	1/2" HDI SS303 / HDI-S	1
HST 5/8" Hand Setting Tool	5/8" HDI / HDI SS303	1
HST 3/4" Hand Setting Tool	3/4" HDI / HDI SS303 / HDI-S	1



¹ All dimensions in inches

SAMMYS® FOR WOOD Pipe Hanger

Part No.	Model	Rod Size	Mount Direction	UL Max Pipe Size	UL Test Load (lbs)	UL Min Wood Thickness	FM Max Pipe Size	FM Test Load (lbs)	FM Min Wood Thickness
8007957	GST 10	3/8"	Vertical	CPVC 1-1/2"	300	1-1/2"			
8020957	SWG 10	3/8"	Horizontal	CPVC 1-1/2"	300	1-1/2"			
8008957	GST 20	3/8"	Vertical	2-1/2"	850	1-1/2"	4"	1475	1-1/2"
8068925	GST 20-SS	3/8"	Vertical	2-1/2"	850	1-1/2"			
8010957	GST 30	3/8"	Vertical	4"	1500	1-1/2"	4"	1475	1-1/2"
8009925	GST 25-380	3/8"	Vertical	4"	1500	1-1/2"			
8022925	SWG 25-380	3/8"	Horizontal	3-1/2" - 4"	1500	1-1/2"			
8021957	SWG 20	3/8"	Horizontal	2-1/2" - 3"	1050	1-1/2"			
8073925	SWG 20-SS	3/8"	Horizontal	2-1/2"	850	1-1/2"			
8139957	SH-GST 20	3/8"	17° Angle off Vertical	3"	1050	1-1/2"	4"	1475	1-1/2"
8141957	SH-GST 30	3/8"	17° Angle off Vertical	4"	1500	1-1/2"	4"	1475	1-1/2"

SAMMYS® FOR STEEL Pipe Hanger

Part No.	Model	Rod Size	Mount Direction	UL Max Pipe Size	UL Test Load (lbs)	UL Min. Steel Thickness	FM Max Pipe Size	FM Test Load (lbs)	FM Min. Steel Thickness
8038957	DSTR 1	3/8"	Vertical	4"	1500	.035"	4"	1475	.105"
8037957	DSTR 1-1/2	3/8"	Vertical	4"	1500	.035"	4"	1475	.105"
8039957	DSTR 516	3/8"	Vertical	4"	1500	.037"	4"	1475	.105"
8045957	DST 516	3/8"	Vertical	4"	1500	.188"	4"	1475	.188"
8046957	TEK 50	3/8"	Vertical	4"	1500	.250"	4"	1475	.188"
8055957	SWDR 1	3/8"	Horizontal	4"	1500	.037"	4"	1475	.060"
8056957	SWDR 516	3/8"	Horizontal	4"	1500	.037"	4"	1475	.060"
8054957	SWDR 1-1/2	3/8"	Horizontal	4"	1500	.037"	4"	1475	.060"
8137957	SH-DSTR 1	3/8"	17° Angle off Vertical	4"	1500	.035"	4"	1475	.105"
8150922	XP 20	3/8"	Vertical	2-1/2"	850	.027"	2" 4"	940 1475	.029" .105"
8153922	XP 35	3/8"	Vertical	4"	1500	.060"	2" 4"	940 1475	.029" .105"
8294922	SXP 20	3/8"	Vertical or up to 45°	2"	750	.027"	2"	635	.029"
8295922	SXP 35	3/8"	Vertical or up to 89°	3-1/2"	1250	.060"	2"	635	.029"
8293957	SWXP 35	3/8"	Horizontal	3-1/2"	1250	.060"			

SAMMYS® FOR CONCRETE Pipe Hanger

Part No.	Model	Rod Size	Mount Direction	UL Max Pipe Size	UL Test Load (lbs)	UL Min PSI	FM Max Pipe Size	FM Test Load (lbs)	FM Min PSI
8059957	CST 20	3/8"	Vertical				4"	1475	3000
8061957	SWC 20	3/8"	Horizontal				4"	1475	3000
8150922	XP 20	3/8"	Vertical	2-1/2"	850	Pre-Pour Structural @ 3000psi			
8150922	XP 20	3/8"	Vertical	2-1/2"	850	Post-Pour Range II LWC ≤ 35 PCF (lbs/ft³)			

TRUSS-T HANGER® Pipe Hanger

Part No.	Model	Rod Size	Mount Direction	UL Load Rating (lbs)	UL Test Load (lbs)	Listed Application
8296900	HD38TC	3/8"	Top Chord	1200	6075	Maximum 4" Schedule 40 pipe
8297900	HD38BC	3/8"	Bottom Chord	1200	6075	Maximum 4" Schedule 40 pipe
8198900	HD12CZP	1/2"	Bottom Chord	1200	6075	Maximum 8" Schedule 40 Pipe
8298900	HD12TC	1/2"	Top Chord	1200	6075	Maximum 8" Schedule 40 Pipe
8299900	HD12BC	1/2"	Bottom Chord	1200	6075	Maximum 8" Schedule 40 Pipe

*SWG 25-380 Maximum pipe size in composite wood joist allowed by UL is 3-1/2"

*SWG 25-380 Maximum pipe size in wood timber or joist allowed by UL is 4"

**SWG 20 Maximum pipe size in composite wood joist allowed by UL is 2-1/2"

**SWG 20 Maximum pipe size in wood timber or joist allowed by UL is 3"

UL compliance with NEC Standards.

UL and FM tests were performed in compliance with NFPA 13 Standards.

Fastening requirement: 5 times weight of water-filled schedule 40 pipe plus 250 pounds.



PIPE HANGER
ALSO LISTED AS CONDUIT AND CABLE HARDWARE
ALSO LISTED AS ANCHOR FOR LUMINAIRE
9R21



TOLCO™ Fig. 200 - "Trimline" Adjustable Band Hanger

TOLCO™ Fig. 200F - "Trimline" Adjustable Band Hanger with Felt Lining for Copper Tubing

TOLCO™ Fig. 200C - "Trimline" Adjustable Band Hanger with Plastic Coated

TOLCO™ Fig. 200S - "Trimline" Adjustable Band Hanger with Removable Nut (For sizes 1" thru 2")

Size Range:

Fig. 200 - 1/2" (15mm) thru 8" (200mm) pipe

Material: Steel, Pre-Galvanized

Function: For fire sprinkler and other general piping purposes. Knurled swivel nut design permits hanger adjustment after installation.

Features:

- 1/2" (15mm) thru 2" (50mm) sizes have flared edges for ease of installation on all pipe types and protects CPVC plastic pipe from abrasion. Captured knurled nut design (flared top) on 1" thru 2" sizes keep nut from separating with hanger. Hanger is easily installed around pipe.
- 1/2" (15mm), 3/4" (20mm), and 2 1/2" (65mm) thru 8" (200mm) Spring tension on nut holds it securely in hanger before installation. Knurled nut is easily removed.
- For 1/2" (15mm) and 3/4" (20mm) sizes with non-captured knurl nuts order Fig. 200S

Approvals: Underwriters Laboratories listed (1/2" (15mm) thru 8" (200mm)) in the USA (**UL**) and Canada (**cUL**) for steel and CPVC plastic pipe and Factory Mutual Engineering Approved (**FM**) (3/4" (20mm) thru 8" (200mm)). Conforms to Federal Specifications WW-H-171E & A-A-1192A, Type 10 and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 10.

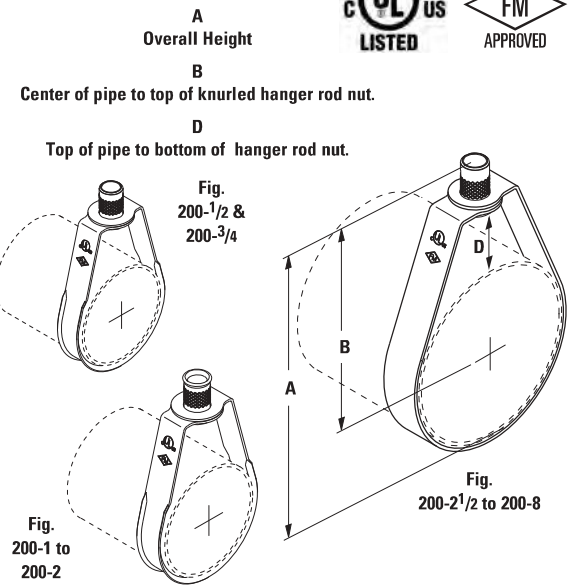
Maximum Temperature: 650°F (343°C)

Finish: Pre-Galvanized. Stainless Steel materials will be supplied with (2) hex nuts in place of a knurl nut.

Order By: Part number and pipe size

**** Note:** For metric hanger rod sizes add the metric rod size to the figure number.
Example: 200M8-1 1/2 or 200M10-1 1/2

† M8 rod size is not UL Listed or FM Approved



Pipe Hangers

Part No.**	Pipe Size		Rod Size		A		B		D		Max. Rec. Load lbs. (kN)	Approx. Wt./100	
	in. (mm)	in. (mm)	in. (mm)	mm**	in. (mm)	in. (mm)	in. (mm)	in. (mm)	lbs. (kg)	lbs. (kg)			
200-1/2	1/2" (15)	3/8"-16	M8† or M10		3 1/8" (79.4)	2 5/8" (66.7)	1 11/32" (34.1)				400 (1.78)	11	(5.0)
200-3/4	3/4" (20)	3/8"-16	M8† or M10		3 1/8" (79.4)	2 1/2" (63.5)	1 1/16" (27.0)				400 (1.78)	11	(5.0)
200-1	1" (25)	3/8"-16	M8† or M10		3 3/8" (85.7)	2 5/8" (66.7)	1 1/8" (28.6)				400 (1.78)	12	(5.5)
200-1 1/4	1 1/4" (32)	3/8"-16	M8† or M10		3 3/4" (94.0)	2 7/8" (73.0)	1 5/32" (29.3)				400 (1.78)	13	(5.9)
200-1 1/2	1 1/2" (40)	3/8"-16	M†8 or M10		3 7/8" (98.4)	2 7/8" (73.0)	1 3/16" (30.2)				400 (1.78)	14	(6.4)
200-2	2" (50)	3/8"-16	M8† or M10		4 1/2" (114.3)	3" (76.3)	1 3/16" (30.2)				400 (1.78)	15	(6.9)
200-2 1/2	2 1/2" (65)	3/8"-16	M10		5 5/8" (142.9)	4 1/8" (104.7)	1 7/16" (36.5)				600 (2.67)	27	(12.3)
200-3	3" (75)	3/8"-16	M10		5 7/8" (149.1)	4" (101.6)	1 1/4" (31.7)				600 (2.67)	29	(13.3)
200-3 1/2	3 1/2" (90)	3/8"-16	M10		7 3/8" (187.3)	5 1/4" (133.3)	2 3/16" (55.6)				600 (2.67)	34	(15.6)
200-4	4" (100)	3/8"-16	M10		7 3/8" (187.3)	5" (127.0)	1 3/8" (34.9)				1000 (4.45)	35	(16.0)
200-5	5" (125)	1/2"-13	M12		9 1/8" (231.8)	6 1/4" (158.7)	3 11/32" (84.9)				1250 (5.56)	66	(30.2)
200-6	6" (150)	1/2"-13	M12		10 1/8" (257.2)	6 3/4" (171.4)	2 7/32" (56.3)				1250 (5.56)	73	(33.4)
200-8	8" (200)	1/2"-13	M12		13 1/8" (333.4)	8 3/4" (222.2)	3 7/32" (81.7)				1250 (5.56)	136	(62.3)

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

Pipe Hangers

TOLCO™ Fig. 1CBS - Clevis Bolt Spacer

Size Range: Size 1" (25mm) thru 20" (500mm) clevis hanger

Material: Steel

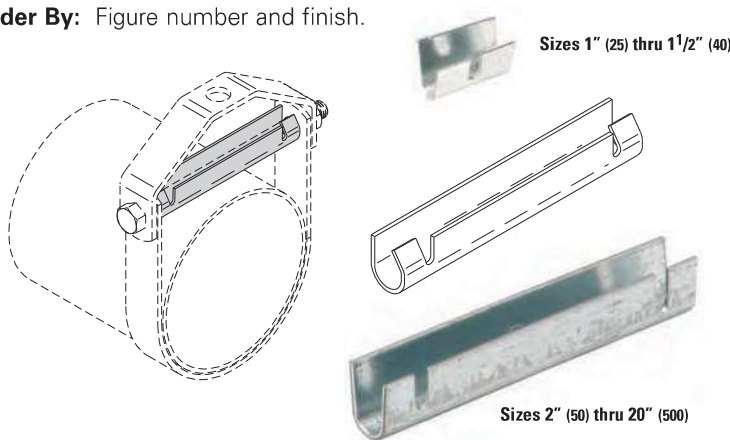
Function: Used as a spacer at a seismic brace location to keep clevis hanger from collapsing during seismic event.

Approvals: 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, for 2½" - 8" (B3100) only

Installation Note: Fig. 1CBS fits easily over the cross bolt and attaches by pinching tabs down.

Finish: Pre-Galvanized. Contact customer service for alternative finishes and materials.

Order By: Figure number and finish.



OPM

Part No.	Pipe Size		Approx. Wt./100	
	in.	(mm)	lbs.	(kg)
1CBS-1	1"	(25)	3.2	(1.4)
1CBS-1¼	1¼"	(32)	4.1	(1.8)
1CBS-1½	1½"	(40)	4.8	(2.2)
1CBS-2	2"	(50)	9.4	(4.2)
1CBS-2½	2½"	(65)	11.4	(5.2)
1CBS-3	3"	(75)	13.9	(6.8)
1CBS-3½	3½"	(90)	16.0	(7.2)
1CBS-4	4"	(100)	18.0	(8.1)
1CBS-5	5"	(125)	27.3	(12.4)
1CBS-6	6"	(150)	32.5	(14.7)
1CBS-8	8"	(200)	42.5	(19.2)
1CBS-10	10"	(250)	72.7	(32.9)
1CBS-12	12"	(300)	86.3	(39.1)
1CBS-14	14"	(350)	157.6	(71.5)
1CBS-16	16"	(400)	183.7	(83.3)
1CBS-18	18"	(450)	224.6	(101.9)
1CBS-20	20"	(500)	254.0	(115.2)

TOLCO™ Fig. 25 - Surge Restrainer

Size Range: — One size fits ¾" (20mm) thru 2" (40mm) pipe.

Material: — Pre-Galvanized Steel

Function: — Designed to be used in conjunction with Fig. 200 band hangers to restrict the upward movement of piping as it occurs during sprinkler head activation or earthquake type activity. The surge restrainer is easily and efficiently installed by snapping into a locking position on the band hanger. This product is intended to satisfy the requirements as indicated in the National Fire Protection Association NFPA 13, 2016 edition, 9.2.3.4.4.1 and 9.2.3.4.4.4. Can be used to restrain either steel pipe or CPVC plastic Pipe.

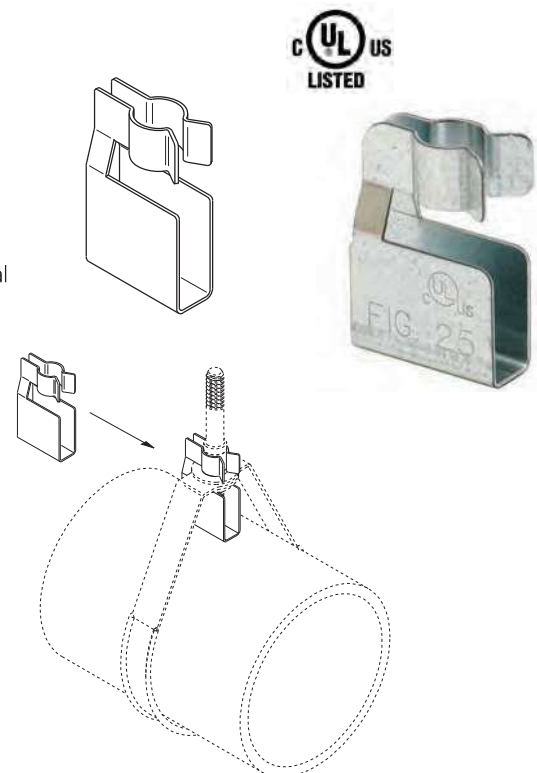
Approvals: — Underwriters Laboratories Listed only when used with band hanger Fig. 200, in the USA (UL) and Canada (cUL).

Finish: Pre-Galvanized

Order By: Figure number and band hanger, size from ¾" (20mm) thru 2" (40mm).

Patent #5,344,108

Part No.	Approx. Wt./100	
	lbs.	(kg)
25	4.8	(2.2)



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