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INDEX

- **HYDRAULIC CALCULATIONS (6) REMOTE AREAS**

- **HEADS**

- **DEVICES**

- **PIPE, FITTINGS, HANGERS & BRACING**

SUPPLIER INFORMATION

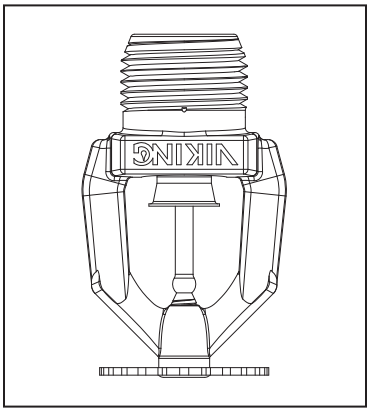
VIKING SUPPLYNET, KENT, WA PH# (253) 872-8444

RELIABLE, SEATTLE(KENT) 877-327-2563

VIKING®	TECHNICAL DATA	FREEDOM® RESIDENTIAL PENDENT SPRINKLER VK468 (K4.9)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

1. DESCRIPTION



Viking Freedom® Residential Pendent Sprinkler VK468 is a small, thermosensitive, glass-bulb residential sprinkler available in several different finishes and temperature ratings to meet varying design requirements. The Electroless Nickel PTFE (ENT) coating has been investigated for installation in corrosive atmospheres and is C-UL-US-EU Listed as corrosion resistant as indicated in the Approval Chart. The orifice design, with a K-Factor of 4.9 (70.6 metric†), allows efficient use of available water supplies for the hydraulically designed fire-protection system. The glass bulb operating element and special deflector characteristics meet the challenges of residential sprinkler standards.

2. LISTINGS AND APPROVALS

c UL us EU **UL Listed (C-UL-US-EU):** Category VKKW

NYC Approved: MEA 89-92-E, Volume 35

UL Classified to: NSF/ANSI Standard 61, Drinking Water System Components (MH48034). Refer to the Approval Chart and Design Criteria for C-UL-US-EU Listing requirements that must be followed.

3. TECHNICAL DATA

Specifications:

Available since 2006.
Minimum Operating Pressure: Refer to the Approval Chart.
Maximum Working Pressure: 175 psi (12 bar). Factory tested hydrostatically to 500 psi (34.5 bar).
Thread size: 1/2” (15 mm) NPT
Nominal K-Factor: 4.9 U.S. (70.6 metric†)
†Metric K-factor measurement shown is in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-1/4” (58 mm)

Viking Technical Data may be found on The Viking Corporation’s Web site at http://www.vikinggroupinc.com. The Web site may include a more recent edition of this Technical Data Page.

Material Standards:

Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Brass UNS-C23000, Phosphor Bronze UNS-C51000, or Brass UNS-C26000
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with Polytetrafluoroethylene (PTFE) Tape
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
Compression Screw: Brass UNS-C36000
For ENT coated sprinklers: Belleville spring - Exposed, Screw and Pipcap - ENT plated.

Ordering Information: (Also refer to the current Viking price list.)

Sprinkler: Base Part No. 13637
Order Sprinkler VK468 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix: 155 °F (68 °C) = B, 175 °F (79 °C) = D
For example, sprinkler VK468 with a Brass finish and a 155 °F (68 °C) temperature rating = Part No. 13637AB.

Available Finishes And Temperature Ratings:

Refer to Table 1.

Accessories: (Also refer to the “Sprinkler Accessories” section of the Viking data book.)

Sprinkler Wrenches:

A. Standard Wrench: Part No. 10896W/B (available since 2000)
B. Wrench for recessed sprinklers: Part No. 13577W/B* (available since 2006)
C. Optional Protective Sprinkler Cap Remover/Escutcheon Installer Tool** Part No. 15915 (available since 2010.)

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*A ½" ratchet is required (not available from Viking).

**Allows use from the floor by attaching a length of 1" diameter CPVC tubing to the tool. Ideal for sprinkler cabinets. Refer to Bulletin F_051808.

Sprinkler Cabinets:

A. Six-head capacity: Part No. 01724A (available since 1971)

B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

The Viking Model VK468 Sprinkler is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, and ENT			
Corrosion Resistant Coatings[3]: ENT			

Footnotes

[1] The sprinkler temperature rating is stamped on the deflector.

[2] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

[3] The corrosion resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Chart. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For ENT coated sprinklers, the waterway is coated. Note that the spring is exposed on sprinklers with ENT coating.

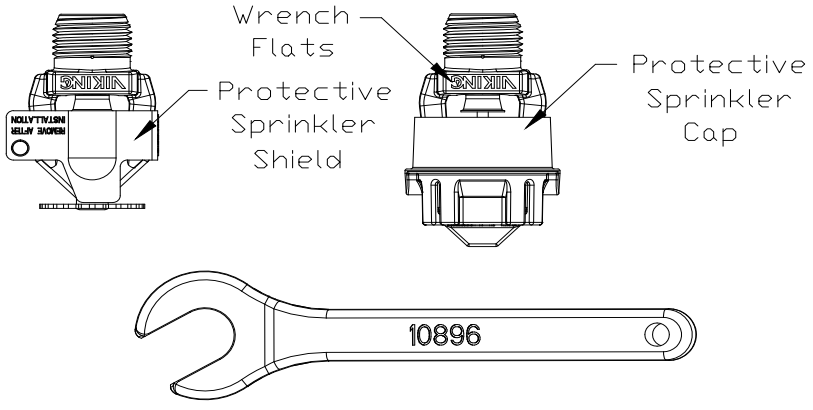

Figure 1: Standard Sprinkler Wrench 10896W/B

VIKING®	TECHNICAL DATA	FREEDOM® RESIDENTIAL PENDENT SPRINKLER VK468 (K4.9)

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Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

Approval Chart
Viking VK468, 4.9 K-Factor Residential Pendent Sprinkler

For systems designed to NFPA 13D or NFPA 13R. For systems designed to NFPA 13, refer to the design criteria. For Ceiling types refer to NFPA 13, 13R or 13D 2013 Editions

Sprinkler Base Part Number[1]	SIN	NPT Thread Size		Nominal K-Factor		Maximum Water Working Pressure	Overall Length	
		Inches	mm	U.S.	metric[2]		Inches	mm
13637	VK468	1/2	15	4.9	70.6	175 psi (12 bar)	2-1/4	58

Max. Coverage Area[4] Ft.X Ft. (m X m)	Ordinary Temp Rating (155 °F/68 °C)		Intermediate Temp Rating (175 °F/79 °C)		Deflector to Ceiling	Installation Type	Listings and Approvals[3]			Minimum Spacing Ft. (m)
	Flow[4] GPM (L/min)	Pressure[4] PSI (bar)	Flow[4] GPM (L/min)	Pressure[4] PSI (bar)			c UL[5] us EU	NYC[6]	NSF[8]	
12 X 12 (3.7 X 3.7)	13 (49.2)	7.0 (0.48)	13 (49.2)	7.0 (0.48)	1-1/8 to 2 inch	Standard surface-mounted escutcheons, the Microfast® Model F-1 Adjustable Escutcheon, or recessed with the Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon	See Footnotes 7 and 10.	See Footnote 7.	See Footnote 7.	8 (2.4)
14 X 14 (4.3 X 4.3)	13 (49.2)	7.0 (0.48)	13 (49.2)	7.0 (0.48)						
16 X 16 (4.9 X 4.9)	13 (49.2)	7.0 (0.48)	13 (49.2)	7.0 (0.48)						
18 X 18 (5.5 X 5.5)	17 (64.4)	12.0 (0.83)	17 (64.4)	12.0 (0.83)						
20 X 20 (6.1 X 6.1)	20 (75.7)	16.7 (1.15)	20 (75.7)	16.7 (1.15)						

Footnotes

[1] Part number shown is the base part number. For complete part number, refer to Viking's current price schedule.

[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

[3] This chart shows the listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals. Refer also to Design Criteria.

[4] For areas of coverage smaller than shown, use the "Flow" and "Pressure" for the next larger area listed. Flows and pressures listed are per sprinkler. The distance from sprinklers to walls shall not exceed one-half the sprinkler spacing indicated for the minimum "Flow" and "Pressure" used.

[5] Listed by Underwriter's Laboratories, Inc. for use in the U.S., Canada, and European Union.

[6] Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 35.

[7] Approved Finishes are: Brass, Chrome, White Polyester, and Black Polyester[9]

[8] UL Classified to: NSF/ANSI Standard 61, Drinking Water System Components (MH48034).

[9] Other paint colors are available on request with the same C-UL-US-EU listings as the standard finish colors.

[10] Approved finish is Electroless Nickel PTFE (ENT). ENT is C-UL-US-EU Listed as corrosion resistant. ENT is available with standard surface-mounted escutcheons or the Micromatic Model E-1 Recessed Escutcheon.

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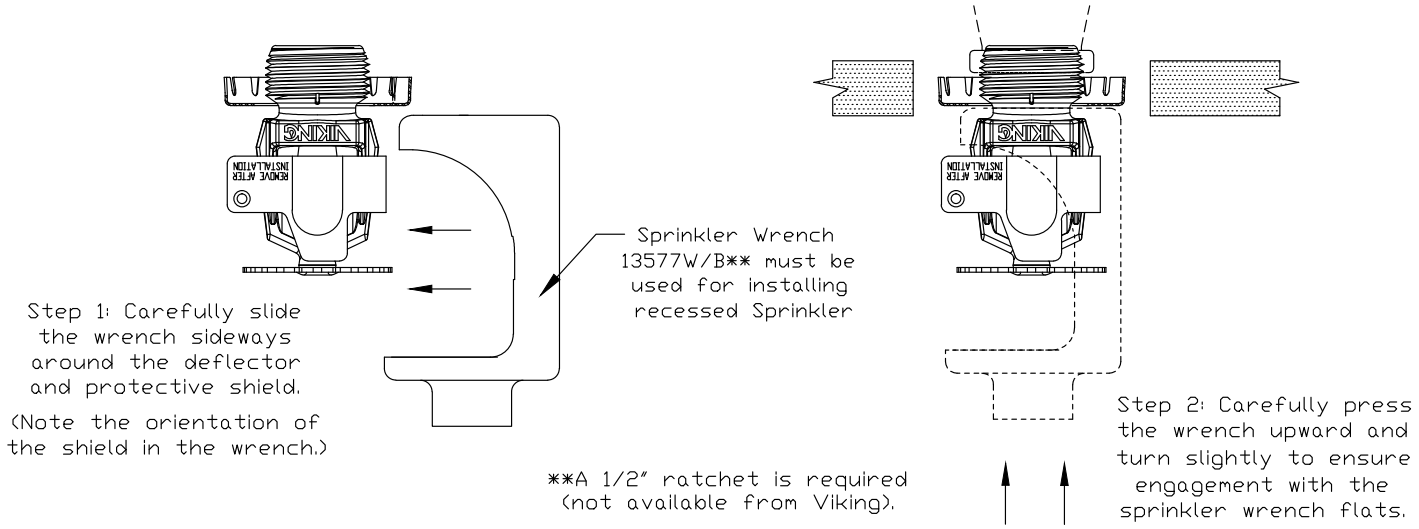

Figure 2: **Wrench 13577W/B for Recessed Sprinkler**

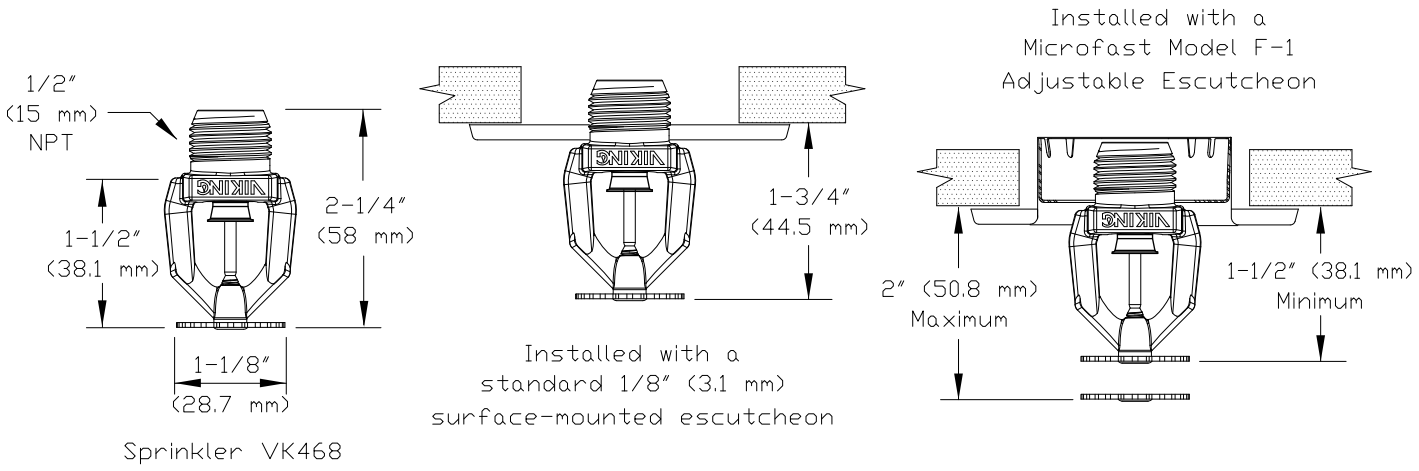

Figure 3: **Sprinkler VK468 Dimensions with a Standard Escutcheon and the Model F-1 Adjustable Escutcheon**

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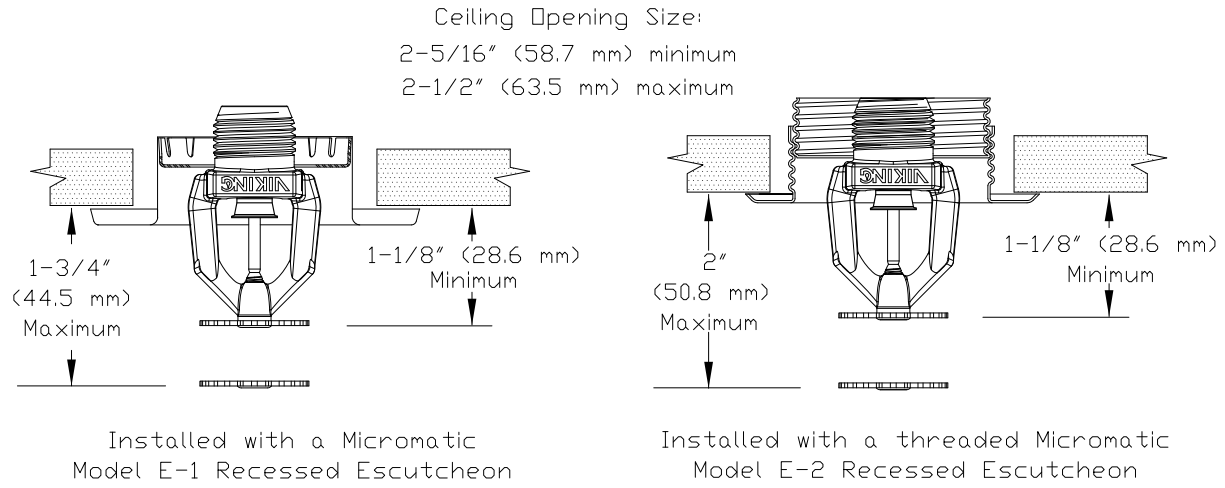


Figure 4: Sprinkler VK468 Dimensions with the Model E-1 and E-2 Recessed Escutcheons

DESIGN CRITERIA

(Also refer to the Approval Chart.)

UL Listing Requirements (C-UL-US-EU):

When using Viking Residential Pendent Sprinkler VK468 for systems designed to NFPA 13D or NFPA 13R, apply the listed areas of coverage and minimum water supply requirements shown in the Approval Chart.

For systems designed to NFPA 13: The number of design sprinklers is to be the four contiguous most hydraulically demanding sprinklers. The minimum required discharge from each of the four sprinklers is to be the greater of the following:

- The flow rates given in the Approval Chart for NFPA 13D and NFPA13R applications for each listed area of coverage, **or**
- Calculated based on a minimum discharge of 0.1 gpm/sq. ft. over the "design area" in accordance with sections 8.5.2.1 or 8.6.2.1.2 of NFPA 13.
- Minimum distance between residential sprinklers: 8 ft. (2.4 m).

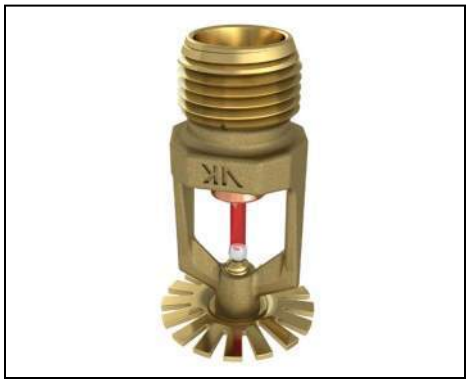
IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to pages RES1-17 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA and any other similar Authorities Having Jurisdiction, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable. Final approval and acceptance of all residential sprinkler installations must be obtained from the Authorities Having Jurisdiction.

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

1. DESCRIPTION



The Viking Microfast® Quick Response Pendent Sprinkler VK302 is a small thermo-sensitive glass bulb spray sprinkler available with various finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive atmospheres and are listed/approved as corrosion resistant as indicated in the Approval Charts. (Note: **FM Global approves ENT finish as corrosion resistant.** FM Global has no approval classification for Polyester coatings as corrosion resistant.)

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Class Series 2000

VdS Approved: Certificates G414009 and G414010

LPCB Approved

CE Certified: Standard EN 12259-1:1999, A3:2006 Certificate of Constancy of Performance 0832-CPR-S0021

CCCF Approved: Approved by the China Certification Center for Fire Products (CCCF)

Refer to Approval Chart 1 and Design Criteria cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria for FM Approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:
Minimum Operating Pressure: 7 psi (0.5 bar)
Rated to 175 psi (12 bar) water working pressure
Factory tested hydrostatically to 500 psi (34.5 bar)
Thread size: 1/2” NPT, 15 mm BSP
Nominal K-Factor: 5.6 U.S. (80.6 metric**)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-1/4” (58 mm)

*cULus Listing, FM Approval, and NFPA 13 installs require a minimum of 7 psi (0.5 bar). The minimum operating pressure for LPCB and CE Approvals ONLY is 5 psi (0.35 bar).

Material Standards:
Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Phosphor Bronze UNS-C51000 or Copper UNS-C19500
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
For Polyester Coated Sprinklers: Belleville Spring-Exposed
For ENT Coated Sprinklers: Belleville Spring-Exposed, Screw and Pipcap - ENT plated.

Ordering Information: (Also refer to the current Viking price list.)
Order Quick Response Pendent Sprinklers by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix: 135 °F (57 °C) = A, 155 °F (68 °C) = B, 175 °F (79 °C) = D, 200 °F (93 °C) = E, 286 °F (141 °C) = G
For example, sprinkler VK302 with a Brass finish and a 155 °F (68 °C) temperature rating = Part No. 12979AB
Available Finishes And Temperature Ratings: Refer to Table 1.
Accessories: (Also refer to the current Viking price list.)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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Sprinkler Wrenches:

A. Standard Wrench: Part No. 10896W/B (available since 2000).
B. Wrench for Recessed Pendent Sprinklers: Part No. 13655W/B** (available since 2006)
C. Optional Protective Sprinkler Cap Remover/Escutcheon Installer Tool*** Part No. 15915 (available since 2010)

**A ½" ratchet is required (not available from Viking).

***Allows use from the floor by attaching a length of 1" diameter CPVC tubing to the tool. Ideal for sprinkler cabinets. Refer to Bulletin F_051808.

Sprinkler Cabinets:

A. Six-head capacity: Part No. 01724A (available since 1971)
B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

The Viking Microfast® Quick Response Pendent Sprinkler VK302 is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

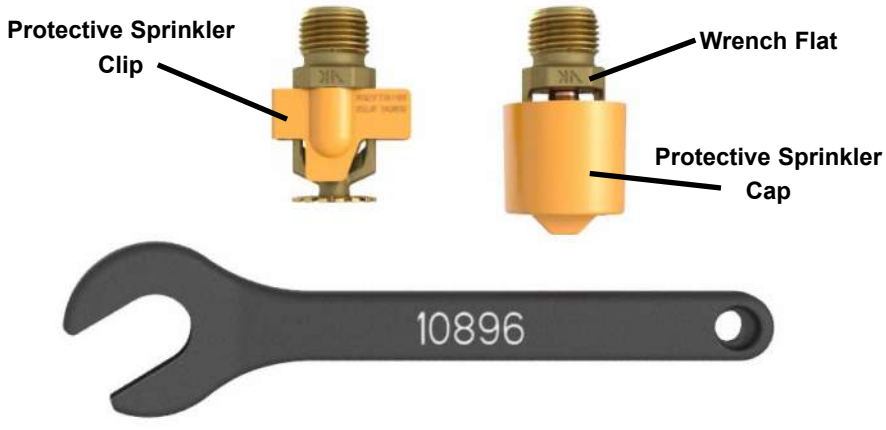

Figure 1: Standard Sprinkler Wrench 10896W/B

VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
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TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	135 °F (57 °C)	100 °F (38 °C)	Orange
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue

Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, and ENT

Corrosion-Resistant Coatings[3]: White Polyester, and Black Polyester. ENT in all temperature ratings except 135 °F (57 °C)

Footnotes

[1] The sprinkler temperature rating is stamped on the deflector.

[2] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

[3] The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Charts. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester and ENT coatings. For ENT coated automatic sprinklers, the waterway is coated.

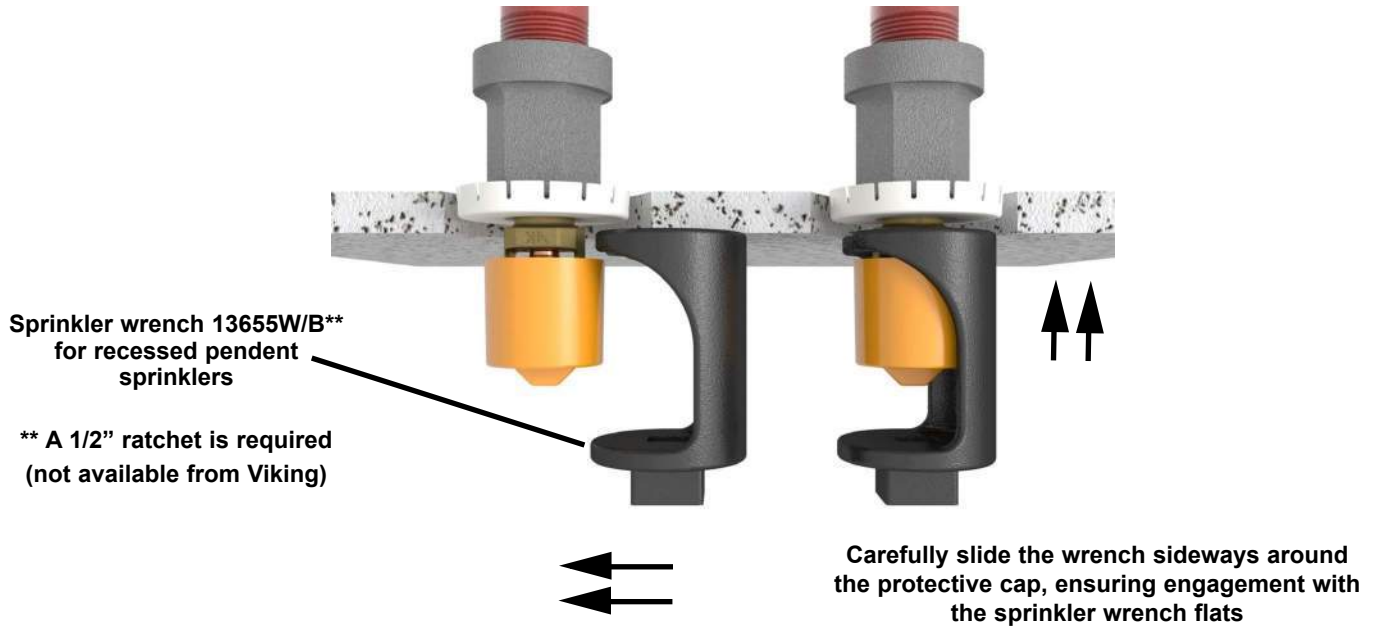

Figure 2: Wrench 13655W/B for Recessed Pendent Sprinklers

VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (K5.6)

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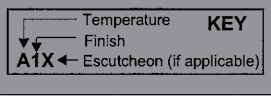
Approval Chart 1 (UL)

The Viking Microfast® Quick Response Pendent Sprinkler VK302
Maximum 175 PSI (12 Bar) WWP



Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3] (Refer also to Design Criteria.)					
			NPT	BSP	U.S.	metric[2]	Inches	mm	cULus[4]	VdS	LPCB	CE[7]		
12979	VK302	Pendent	1/2”	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2, C2X	A1	A1Z, B1Y	D1Z, C1Y	--	--
19780	VK302	Pendent	1/2”	--	5.6	80.6	2-1/4	58	--	--	--	--	--	D3
21354	VK302	Pendent	--	15 mm	5.6	80.6	2-1/4	58	--	--	--	--	--	D3
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)														
06662B	VK302	Pendent	1/2”	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2, C2X	--	--	--	--	--
18021	VK302	Pendent	1/2”	15 mm	5.6	80.6	2-1/4	58	A1X, B1Y	A1	A1X, B1Y	D1X, C1Y[8]	D1X, C1Y[9]	--

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C)
B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
C - 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
D - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C)

Approved Finishes

1 - Brass, Chrome, White Polyester[5,6], Black Polyester[5,6]
2 - ENT[5]
3 - Chrome

Approved Escutcheons

X - Standard surface-mounted escutcheon or the Viking Micromatic® Model E-1 Recessed Escutcheon
Y - Standard surface-mounted escutcheon or the Viking Microfast® Model F-1 Adjustable Escutcheon, or recessed with the Viking Micromatic® Model E-1, E-2, or E-3 Recessed Escutcheon
Z - Standard surface-mounted escutcheon or the Viking Microfast® Model F-1 Adjustable Escutcheon

Footnotes

[1] Base part number shown. For complete part number, refer to Viking’s current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the listings and approvals available at the time of printing. Other approvals may be in process.
[4] Listed by Underwriters Laboratories Inc. for use in the U.S. and Canada.
[5] cULus Listed as corrosion-resistant.
[6] Other colors are available on request with the same Listings and Approvals as the standard colors.
[7] CE Certified, Standard EN 12259-1, EC-certificate of conformity 0832-CPD-2001.
[8] CE Certified, Standard EN 12259-1, EC-certificates of conformity 0832-CPD-2001 and 0832-CPD-2003.
[9] MED Certified, Standard EN 12259-1, EC-certificates of conformity 0832-MED-1003 and 0832-MED-1008.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 above.)

cULus Listing Requirements:

The Viking Microfast® Quick Response Pendent Sprinkler VK302 is cULus Listed as indicated in the Approval Chart for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

- Designed for use in Light and Ordinary occupancies.
- The sprinkler installation rules contained in NFPA 13 for standard spray pendent sprinklers must be followed.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING®

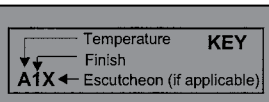
TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

Approval Chart 2 (FM)

The Viking Microfast® Quick Response Pendent Sprinkler VK302
Maximum 175 PSI (12 Bar) WWP



Base Part Number[1]	SIN	Sprinkler Style	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3] (Refer also to Design Criteria.)
			NPT	BSP	U.S.	metric[2]	Inches	mm	
12979	VK302	Pendent	1/2"	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2X, C2
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)									
06662B	VK302	Pendent	1/2"	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y, D2X, C2
18021	VK302	Pendent	1/2"	15 mm	5.6	80.6	2-1/4	58	A1Z, B1Y

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C)
B - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)
C - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), 286 °F (141 °C)
D - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C)

Approved Finishes

1 - Brass, Chrome, White Polyester[4], and Black Polyester[4]
2 - ENT[5]

Approved Escutcheons

X - Standard surface-mounted escutcheon or the Viking Micromatic® Model E-1 Recessed Escutcheon
Y - Standard surface-mounted escutcheon or the Viking Microfast® Model F-1 Adjustable Escutcheon, or recessed with the Viking Micromatic® Model E-1 or E-2 Recessed Escutcheon
Z - Standard surface-mounted escutcheon or the Viking Microfast® Model F-1 Adjustable Escutcheon

Footnotes

[1] Base part number shown. For complete part number, refer to Viking's current price schedule.

[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

[3] This table shows the FM Approvals available at the time of printing. Other approvals may be in process.

[4] Other colors are available on request with the same Approvals as the standard colors.

[5] FM approved as corrosion resistant.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

The Viking Microfast® Quick Response Pendent Sprinkler VK302 is FM Approved as quick response **Non-storage** pendent sprinklers as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE PENDENT SPRINKLER VK302 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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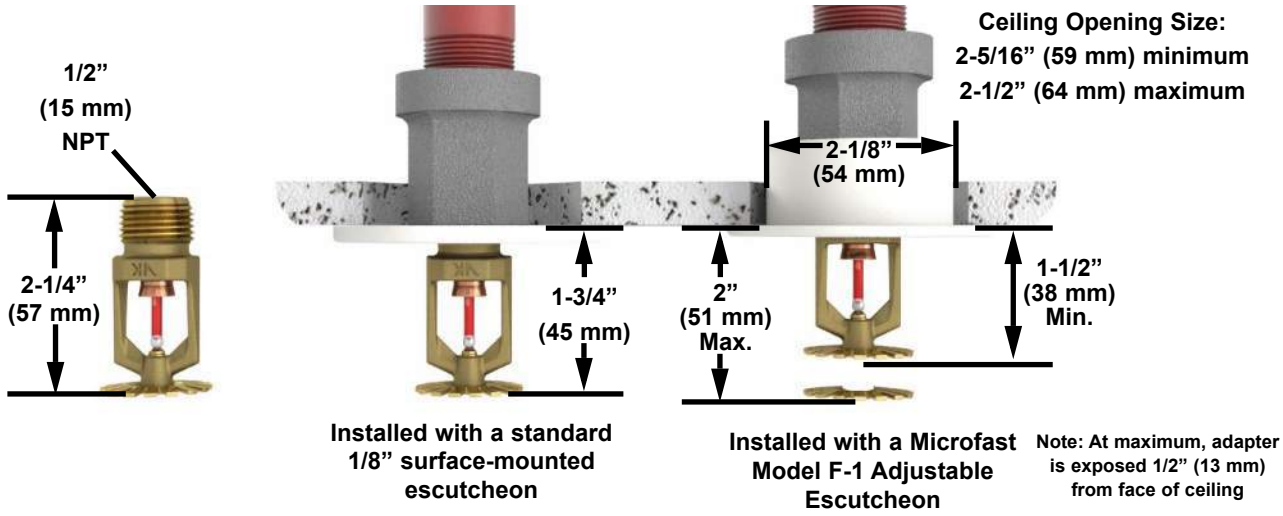

Figure 3: Sprinkler Dimensions with a Standard Escutcheon and the Model F-1 Adjustable Escutcheon

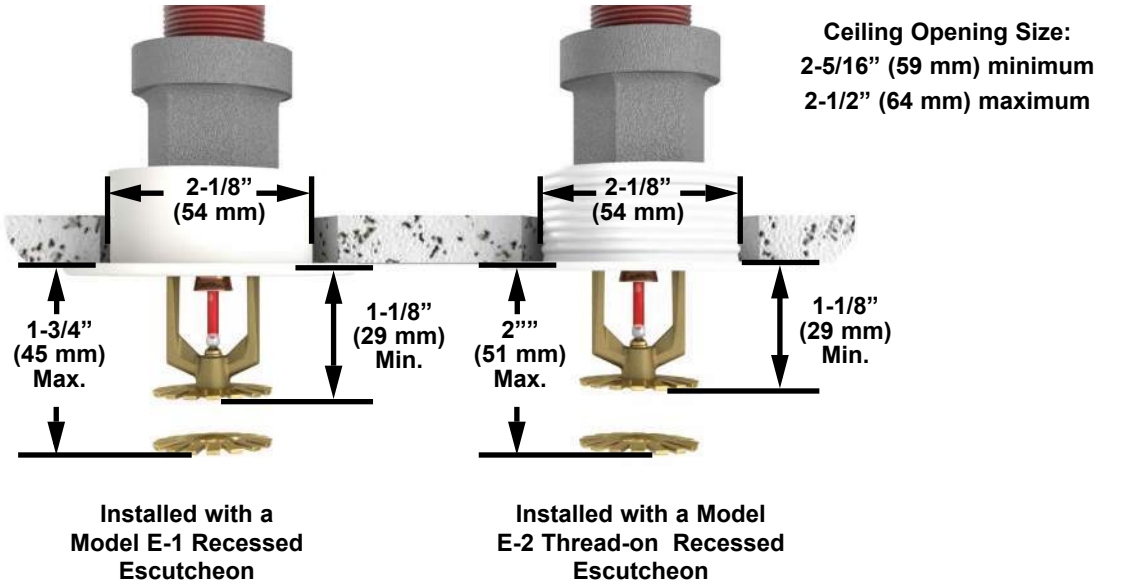

Figure 4: Sprinkler Dimensions with the Model E-1 and E-2 Recessed Escutcheons

TECHNICAL DATA

MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK300 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

1. DESCRIPTION

The Viking Microfast® Quick Response Upright Sprinkler VK300 is a small, thermosensitive, glass-bulb spray sprinkler available in several different finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings can be used in decorative applications where colors are desired. In addition, these coatings have been investigated for installation in corrosive atmospheres and are listed/approved as corrosion resistant as indicated in the Approval Charts.

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

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV

FM Approved: Classes 2002 and 2020

Refer to Approval Charts and Design Criteria for listing and approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:

Minimum Operating Pressure: 7 psi (0.5 bar)*
Maximum Working Pressure: 175 psi (12 bar) wwp.
Factory tested hydrostatically to 500 psi (34.5 bar)
Testing: U.S.A. Patent No. 4,831,870
Thread size: 1/2” NPT, 15 mm BSP
Nominal K-Factor: 5.6 U.S. (80.6 metric**)
Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Overall Length: 2-3/16” (56 mm)

*cULus Listing, FM Approval, and NFPA 13 installs require a minimum of 7 psi (0.5 bar). The minimum operating pressure for LPCB and CE Approvals ONLY is 5 psi (0.35 bar).

Material Standards:

Frame Casting: Brass UNS-C84400 or QM Brass
Deflector: Brass UNS-C23000 or Copper UNS-C19500
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Screw: Brass UNS-C36000
Pip Cap and Insert Assembly: Copper UNS-C11000 and Stainless Steel UNS-S30400
For Polyester Coated Sprinklers: Belleville Spring-Exposed
For ENT Coated Sprinklers: Belleville Spring-Exposed, Screw and Pipcap - ENT plated

Ordering Information: (Also refer to the current Viking price list.)

Order Viking Microfast® Quick Response Upright Sprinkler VK300 by first adding the appropriate suffix for the sprinkler finish and then the appropriate suffix for the temperature rating to the sprinkler base part number.
Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, Black Polyester = M-/B, and ENT = JN
Temperature Suffix (°F/°C): 135°/57° = A, 155°/68° = B, 175°/79° = D, 200°/93° = E, and 286°/141° = G
For example, sprinkler VK300 with a 1/2” NPT thread, Brass finish and a 155 °F/68 °C temperature rating = Part No. 12978AB

Available Finishes And Temperature Ratings: Refer to Table 1.

Accessories: (Also refer to the Viking website.)

Sprinkler Wrench: Standard Wrench: Part No. 21475M/B (available since 2017)

Sprinkler Cabinets:
A. Six-head capacity: Part No. 01724A (available since 1971)
B. Twelve-head capacity: Part No. 01725A (available since 1971)

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

VIKING®

TECHNICAL DATA

MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK300 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page: www.vikinggroupinc.com

5. OPERATION

During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the pip cap and sealing spring assembly. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

The Viking Microfast® Quick Response Upright Sprinkler VK300 is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	135 °F (57 °C)	100 °F (38 °C)	Orange
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue

Sprinkler Finishes: Brass, Chrome, White Polyester, Black Polyester, and ENT

Corrosion-Resistant Coatings[3]: White Polyester, Black Polyester, and Black PTFE. ENT in all temperature ratings except 135 °F (57 °C)

Footnotes

[1] The sprinkler temperature rating is stamped on the deflector.
[2] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.
[3] The corrosion-resistant coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Charts. These tests cannot and do not represent all possible corrosive environments. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. For automatic sprinklers, the coatings indicated are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester, ENT, and PTFE coatings. For ENT coated automatic sprinklers, the waterway is coated.

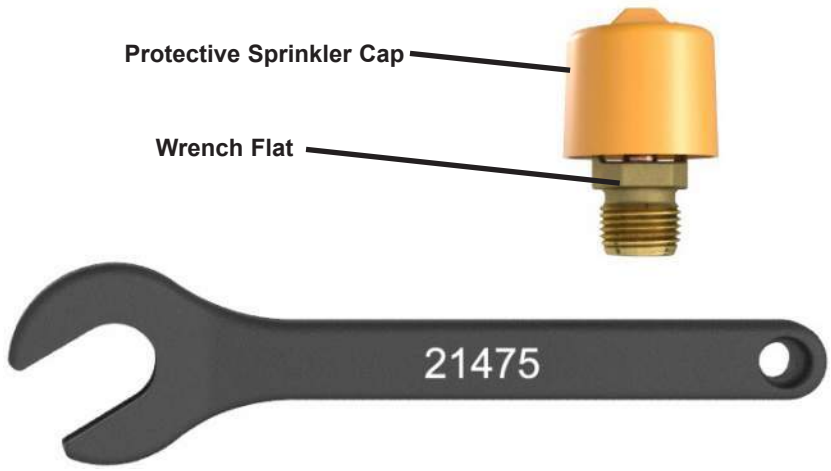

Figure 1:
Standard Sprinkler Wrench 21475M/B

TECHNICAL DATA

MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK300 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
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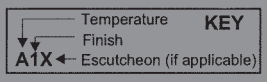
Approval Chart 1 (UL)

Microfast® Quick Response Upright Sprinkler VK300 Maximum 175 PSI (12 bar) WWP



Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		Listings and Approvals[3]				
		NPT	BSP	U.S.	metric[2]	Inches	mm	cULus	VdS	LPCB	NYC[8]	CE
12978	VK300	1/2”	15 mm	5.6	80.6	2-3/16	56	A1, B2	--	--	See footnote 7.	--
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)												
06661B	VK300	1/2”	15 mm	5.6	80.6	2-3/16	56	A1, B2	--	--	See footnote 7.	--

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141°C)
B - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141°C)

Approved Finishes

1 - Brass, Chrome, White Polyester[5,6], and Black Polyester[5,6]
2 - ENT[6]

Footnotes

[1] Base part number is shown. For complete part number, refer to Viking’s current price schedule.
[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[3] This table shows the listings and approvals available at the time of printing. Check with the manufacturer for any additional approvals.
[4] Listed by Underwriters Laboratories Inc. for us in the U.S. and Canada
[5] Other colors are available on request with the same Listings and Approvals as the standard colors.
[6] cULus Listed as corrosion resistant.
[7] Meets New York City requirements, effective July 1, 2008
[8] Accepted for use, City of New York Board of Standards and Appeals, Calendar Number 219-76-SA and City of New York Department of Buildings, MEA 89-92-E, Vol. 16.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 above.)

cULus Listing Requirements:

The Viking Microfast® Quick Response Upright Sprinkler VK300 is cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

- Designed for use in Light and Ordinary Hazard occupancies.
- The sprinkler installation rules contained in NFPA 13 for standard spray upright sprinklers must be followed.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING®	TECHNICAL DATA	MICROFAST® QUICK RESPONSE UPRIGHT SPRINKLER VK300 (K5.6)

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
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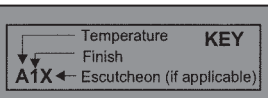
Approval Chart 2 (FM)

Microfast® Quick Response Upright Sprinkler VK300
Maximum 175 PSI (12 bar) WWP



Base Part Number[1]	SIN	Thread Size		Nominal K-Factor		Overall Length		FM Approvals[3] (Refer also to Design Criteria below.)
		NPT	BSP	U.S.	metric[2]	Inches	mm	
12978	VK300	1/2”	15 mm	5.6	80.6	2-3/16	56	A1, B2
NOTICE - Product Below - Limited Availability (Contact Local Viking Office)								
06661B	VK300	1/2”	15 mm	5.6	80.6	2-3/16	56	A1, B2

Approved Temperature Ratings

A - 135 °F (57 °C), 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141°C)
B - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141°C)

Approved Finishes

1 - Brass, Chrome, White Polyester[5], and Black Polyester[5]
2 - ENT[6]

Footnotes

[1] Base part number is shown. For complete part number, refer to Viking’s current price schedule.

[2] Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

[3] This table shows the FM Approvals available at the time of printing. Check with the manufacturer for any additional approvals.
[5] Other colors are available on request with the same Approvals as the standard colors.
[6] FM approved as corrosion resistant.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

FM Approval Requirements:

The Microfast® Quick Response Upright Sprinkler VK300 is FM Approved as a quick response **Non-Storage** upright sprinkler as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including Data Sheet 2-0). FM Global Loss Prevention Data Sheets contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to Form No. F_080614 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING	BULLETIN	CARE AND HANDLING OF SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

SPRINKLERS ARE FRAGILE - HANDLE WITH CARE!

General Handling and Storage:

- Store sprinklers in a cool, dry place.
- Protect sprinklers during storage, transport, handling, and after installation.
- Use the original shipping containers. DO NOT place sprinklers loose in boxes, bins, or buckets.
- Keep sprinklers separated at all times. DO NOT allow metal parts to contact sprinkler operating elements.

For Pre-Assembled Drops:

- Protect sprinklers during handling and after installation.
- For recessed assemblies, use the protective sprinkler cap (Viking Part Number 10364).

Sprinklers with Protective Shields or Caps:

- DO NOT remove shields or caps until after sprinkler installation and there no longer is potential for mechanical damage to the sprinkler operating elements.
- **Sprinkler shields or caps MUST be removed BEFORE placing the system in service!**
- Remove the sprinkler shield by carefully pulling it apart where it is snapped together.
- Remove the cap by turning it slightly and pulling it off the sprinkler.

Sprinkler Installation:

- DO NOT use the sprinkler deflector or operating element to start or thread the sprinkler into a fitting.
- **Use only the designated sprinkler head wrench!** Refer to the current sprinkler technical data page to determine the correct wrench for the model of sprinkler used.
- DO NOT install sprinklers onto piping at the floor level.
- Install sprinklers after the piping is in place to prevent mechanical damage.
- DO NOT allow impacts such as hammer blows directly to sprinklers or to fittings, pipe, or couplings in close proximity to sprinklers. Sprinklers can be damaged from direct or indirect impacts.
- DO NOT attempt to remove drywall, paint, etc., from sprinklers.
- **Take care not to over-tighten the sprinkler and/or damage its operating parts!**

  Maximum Torque:
  1/2" NPT: 14 ft-lbs. (19.0 N-m)
  3/4" NPT: 20 ft-lbs. (27.1 N-m)
  1" NPT: 30 ft-lbs. (40.7 N-m)

CORRECT
(Original container used)

INCORRECT
(Placed loose in box)

CORRECT
(Protected with caps)

INCORRECT
(Protective caps not used)

CORRECT
(Piping is in place at the ceiling)

INCORRECT
(Sprinkler at floor level)

CORRECT
(Special installation wrenches)

INCORRECT
(Designated wrench not used)

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

⚠ WARNING

Any sprinkler with a loss of liquid from the glass bulb or damage to the fusible element should be destroyed. Never install sprinklers that have been dropped, damaged, or exposed to temperatures exceeding the maximum ambient temperature allowed. Sprinklers that have been painted in the field must be replaced per NFPA 13. Protect sprinklers from paint and paint overspray in accordance with the installation standards. Do not clean sprinklers with soap and water, ammonia, or any other cleaning fluid. Do not use adhesives or solvents on sprinklers or their operating elements.

Refer to the appropriate technical data page and NFPA standards for complete care, handling, installation, and maintenance instructions. For additional product and system information Viking data pages and installation instructions are available on the Viking Web site at www.vikinggroupinc.com.

VIKING	BULLETIN	CARE AND HANDLING OF SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

PROTECTIVE SPRINKLER SHIELDS AND CAPS

General Handling and Storage:

Many Viking sprinklers are available with a plastic protective cap or shield temporarily covering the operating elements. The snap-on shields and caps are factory installed and are intended to help protect the operating elements from mechanical damage during shipping, storage, and installation. NOTE: It is still necessary to follow the care and handling instructions on the appropriate sprinkler technical data sheets* when installing sprinklers with bulb shields or caps.

WHEN TO REMOVE THE SHIELDS AND CAPS:

NOTE: SHIELDS AND CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!

Remove the shield or cap from the sprinkler only after checking all of the following:

- The sprinkler has been installed*.
- The wall or ceiling finish work is completed where the sprinkler is installed and there no longer is a potential for mechanical damage to the sprinkler operating elements.

SHIELDS AND CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!

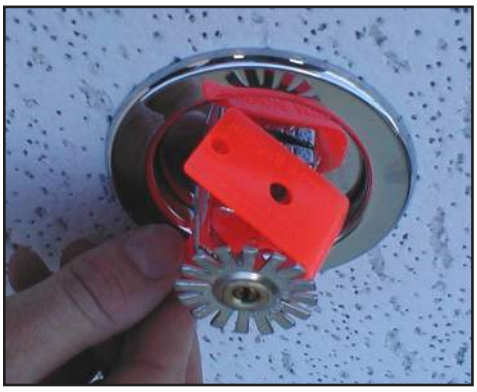


Figure 1: Sprinkler shield being removed from a pendent sprinkler.

Figure 2: Sprinkler cap being removed from a pendent sprinkler.

Figure 3: Sprinkler cap being removed from and upright sprinkler.

HOW TO REMOVE SHIELDS AND CAPS:

No tools are necessary to remove the shields or caps from sprinklers. DO NOT use any sharp objects to remove them! **Take care not to cause mechanical damage to sprinklers when removing the shields or caps.** When removing caps from fusible element sprinklers, use care to prevent dislodging ejector springs or damaging fusible elements. NOTE: Squeezing the sprinkler cap excessively could damage sprinkler fusible elements.

- To remove the shield, simply pull the ends of the shield apart where it is snapped together. Refer to Figure 1.
- To remove the cap, turn it slightly and pull it off the sprinkler. Refer to Figures 2 and 3.

NOTICE Refer to the current sprinkler technical data page to determine the correct sprinkler wrench for the model of sprinkler used.

WARNING Never install sprinklers that have been dropped, damaged, or exposed to temperatures in excess of the maximum ambient temperature allowed.

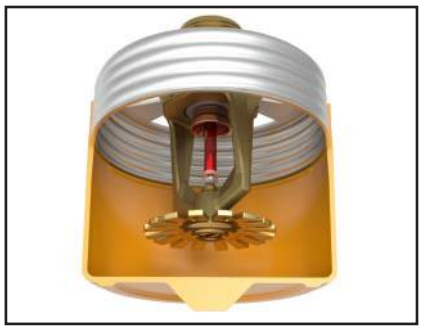
*** Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.**

BULLETIN

CARE AND HANDLING OF SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

CAUTION CONCEALED COVER ASSEMBLIES ARE FRAGILE!
TO ASSURE SATISFACTORY PERFORMANCE OF THE PRODUCT, HANDLE WITH CARE.



Concealed Sprinkler and Adapter Assembly with Protective Cap

Concealed Sprinkler and Adapter Assembly (Protective Cap Removed)

Cover Plate Assembly (Pendent Cover 12381 shown)

GENERAL HANDLING AND STORAGE INSTRUCTIONS:

- Do not store in temperatures exceeding 100 °F (38 °C). Avoid direct sunlight and confined areas subject to heat.
- Protect sprinklers and cover assemblies during storage, transport, handling, and after installation.
  -- Use original shipping containers.
  -- Do not place sprinklers or cover assemblies loose in boxes, bins, or buckets.
- Keep the sprinkler bodies covered with the protective sprinkler cap any time the sprinklers are shipped or handled, during testing of the system, and while ceiling finish work is being completed.
- Use only the designated Viking recessed sprinkler wrench (refer to the appropriate sprinkler data page) to install these sprinklers. **NOTE:** The protective cap is temporarily removed during installation and then placed back on the sprinkler for protection until finish work is completed.
- Do not over-tighten the sprinklers into fittings during installation.
- Do not use the sprinkler deflector to start or thread the sprinklers into fittings during installation.
- Do not attempt to remove drywall, paint, etc., from the sprinklers.
- Remove the plastic protective cap from the sprinkler before attaching the cover plate assembly. **PROTECTIVE CAPS MUST BE REMOVED FROM SPRINKLERS BEFORE PLACING THE SYSTEM IN SERVICE!**

Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.

VIKING

BULLETIN

CARE AND HANDLING OF SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

USE THE FOLLOWING PRECAUTIONS WHEN HANDLING WAX-COATED SPRINKLERS

Many of Viking's sprinklers are available with factory-applied wax coating for corrosion resistance. These sprinklers MUST receive appropriate care and handling to avoid damaging the wax coating and to assure satisfactory performance of the product.

General Handling and Storage of Wax-Coated Sprinklers:

- Store the sprinklers in a cool, dry place (in temperatures below the maximum ambient temperature allowed for the sprinkler temperature rating. Refer to Table 1 below.)
- Store containers of wax-coated sprinklers separate from other sprinklers.
- Protect the sprinklers during storage, transport, handling, and after installation.
- Use original shipping containers.
- Do not place sprinklers in loose boxes, bins, or buckets.

Installation of Wax-Coated Sprinklers:

Use only the special sprinkler head wrench designed for installing wax-coated Viking sprinklers (any other wrench may damage the unit).

- Take care not to crack the wax coating on the units.
- For touching up the wax coating after installation, wax is available from Viking in bar form. Refer to Table 1 below. The coating MUST be repaired after sprinkler installation to protect the corrosion-resistant properties of the sprinkler.
- Use care when locating sprinklers near fixtures that can generate heat. Do not install sprinklers where they would be exposed to temperatures exceeding the maximum recommended ambient temperature for the temperature rating used.
- Inspect the coated sprinklers frequently soon after installation to verify the integrity of the corrosion resistant coating. Thereafter, inspect representative samples of the coated sprinklers in accordance with NFPA 25. Close up visual inspections are necessary to determine whether the sprinklers are being affected by corrosive conditions.

TABLE 1

Sprinkler Temperature Rating (Fusing Point)	Wax Part Number	Wax Melting Point	Maximum Ambient Ceiling Temperature[1]	Wax Color
155 °F (68 °C) / 165 °F (74 °C)	02568A	148 °F (64 °C)	100 °F (38 °C)	Light Brown
175 °F (79 °C)	04146A	161 °F (71 °C)	150 °F (65 °C)	Brown
200 °F (93 °C)	04146A	161 °F (71 °C)	150 °F (65 °C)	Brown
220 °F (104 °C)	02569A	170 °F (76 °C)	150 °F (65 °C)	Dark Brown
286 °F (141 °C)	02569A	170 °F (76 °C)	150 °F (65 °C)	Dark Brown

[1] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

⚠WARNING Never install sprinklers that have been dropped, damaged, or exposed to temperatures in excess of the maximum ambient temperature allowed.

Refer to the appropriate current technical data pages for complete care, handling, and installation instructions. Data pages are included with each shipment from Viking or Viking distributors. They can also be found on the Web site at www.vikinggroupinc.com.

VIKING®	BULLETIN	REGULATORY AND HEALTH WARNINGS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com
Visit the Viking website for the latest edition of this technical data page www.vikinggroupinc.com

1. DESCRIPTION

Regulatory and Health Warnings applying to materials used in the manufacture and construction of fire protection products are provided herin as they relate to legally mandated jurisdictional regions.

⚠ WARNING

STATE OF CALIFORNIA, USA

Installing or servicing fire protection products such as sprinklers, valves, piping etc. can expose you to chemicals including, but not limited to, lead, nickel, butadiene, titaninum dioxide, chromium, carbon black, and acrylonitrile which are known to the State of California to cause cancer or birth defects or other reproductive harm.

For more information, go to **www.P65Warnings.ca.gov**

2. WARRANTY TERMS AND CONDITIONS

For details of warranty, refer to Viking's current list price schedule at **www.vikinggroupinc.com** or contact Viking directly.

VIKING®

TECHNICAL DATA

QUICK RESPONSE DRY HORIZONTAL SIDEWALL SPRINKLERS

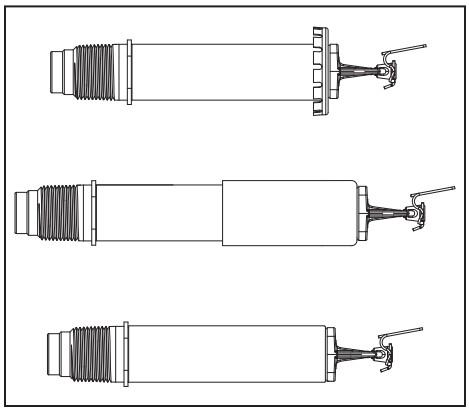
The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

1. DESCRIPTION

Viking Quick Response Dry Horizontal Sidewall Sprinklers are thermosensitive spray sprinklers suitable for use in areas subject to freezing. The sprinklers are designed for dry systems and preaction systems where it is necessary to prevent water or condensation from entering the drop nipple before sprinkler operation. They may also be installed in spaces subject to freezing and supplied from a wet system in an adjacent heated area.

Viking Quick Response Dry HSW Sprinklers are available in various finishes and temperature ratings to meet design requirements. The special Polyester and Electroless Nickel PTFE (ENT) coatings have been investigated for installation in corrosive atmospheres and are listed/approved as corrosion resistant as indicated in the Approval Charts. (Note: FM Global has no approval classification for Polyester coatings as corrosion resistant.)

NOTE: When installed in some corrosive environments, the Polyester finish may change color. This natural discoloration over time is not in itself an indication of corrosion and should not be treated as such. All sprinklers installed in corrosive environments should be replaced or tested as described in NFPA 25 on a more frequent basis.



For Light Hazard Occupancies Only

2. LISTINGS AND APPROVALS

cULus Listed: Category VNIV
FM Approved: Classes 2013 and 2015
NYC Approved: MEA 89-92-E, Volume 15

Refer to Approval Chart 1 and Design Criteria on page 106c for cULus Listing requirements, and refer to Approval Chart 2 and Design Criteria on page 106d for FM Approval requirements that must be followed.

3. TECHNICAL DATA

Specifications:
Available since 1993.
Minimum Operating Pressure: 7 psi (0.5 bar)
Maximum Working Pressure: 175 psi (12 bar).
Factory tested pneumatically to 100 psi (6.89 bar)
Thread size: 1" NPT or 25 mm BSP
Nominal K-Factor: 5.6 U.S. (80.6 metric*) for all listed and approved lengths.

* Metric K-factor measurement shown is when pressure is measured in Bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.

Glass-bulb fluid temperature rated to -65 °F (-55 °C)
Covered by the following U.S. Patent numbers: 8,636,075 and 8,376,060

Viking Technical Data may be found on The Viking Corporation's Web site at http://www.vikinggroupinc.com. The Web site may include a more recent edition of this Technical Data Page.

Material Standards:
Frame Casting: Brass UNS-C84400
Deflector: Phosphor Bronze UNS-C51000
Bulb: Glass, nominal 3 mm diameter
Belleville Spring Sealing Assembly: Nickel Alloy, coated on both sides with PTFE Tape
Compression Screw: Brass UNS-C36000
Pip Cap: Brass UNS-C31400 or UNS-C31600
Pip Cap Adapter: Brass UNS-C36000
Orifice: Copper UNS-C22000 or UNS-C11000
Tube: ERW Hydraulic Steel Tube
Support (Internal): Stainless Steel UNS-S30400
Barrel: Steel Pipe UNS-G10260, Electrodeposited Epoxy Base finish
Barrel End and Threads: QM Brass
Sleeve (for Adjustable Standard style only): Brass UNS-C26000 or UNS-C26800

Escutcheon Materials:
Adjustable Standard Dry Escutcheons: Brass UNS-C26000 or UNS-C26800
Recessed Dry Escutcheons: Cold Rolled Steel UNS-G10080
ENT Coated Adjustable and Recessed Escutcheons: Stainless Steel UNS-S30400

Ordering Information: (Also refer to the current Viking price list.)
Order QR Dry HSW Sprinklers by first adding the appropriate suffix for the sprinkler finish, the appropriate suffix for the temperature rating, and then the suffix for the length ("A" dimension) to sprinkler base part number. Order in a specific length noted as the "A" dimension. The "A" dimension is the distance from the face of the fitting (tee) to the desired finished surface of the wall in which it is to be installed.

VIKING®

TECHNICAL DATA

QUICK RESPONSE DRY HORIZONTAL SIDEWALL SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

These sprinklers are listed and approved in lengths from 1-1/2" to 45-1/2" (38.1 mm to 1,156 mm) for the adjustable standard style, 3" to 47" (76.2 mm to 1,194 mm) for the plain barrel style, and 3-1/4" to 47-1/2" (82.5 mm to 1,207 mm) for the adjustable recessed style.

Lengths exceeding the standard lengths are available, with no approvals, on a "made-to-order" basis: Recessed Dry HSW up to 65-1/2" (1,664 mm). Adjustable Standard Dry HSW up to 63-1/2" (1,613 mm). Plain Barrel Dry HSW up to 65" (1,651 mm). Contact the manufacturer for more information.

Finish Suffix: Brass = A, Chrome = F, White Polyester = M-/W, and ENT = JN

Temperature Suffix: 155 °F (68 °C) = B, 175 °F (79 °C) = D, 200 °F (93 °C) = E, 286 °F (141 °C) = G

Escutcheon Suffix = Y for the adj. recessed sprinkler with the Model G-1 Escutcheon (no suffix needed for the Model E-1 Escutcheon).

For example, sprinkler VK182 with 1" NPT Threads, a Chrome finish, a 155 °F (68 °C) temperature rating, the Model G-1 Escutcheon, and "A" length of 10" = Part No. 08386UFBY10.

Available Finishes And Temperature Ratings: Refer to Table 1.

Accessories: (Also refer to the "Sprinkler Accessories" section.)

Sprinkler Wrenches:

A. Standard Wrench: Part No. 07297W/B (available since 1991)

B. Wrench for recessed sprinklers: Part No. 07565W/B** (available since 1991)
**A ½" ratchet is required (not available from Viking).

Dry Sprinkler Protective Cover: Part No. 15610

Replacement Escutcheons:

A. Adjustable Standard Dry Escutcheon: Base Part No. 08086F

B. Model E-1 Recessed Dry Escutcheon Cup: Base Part No. 05459A

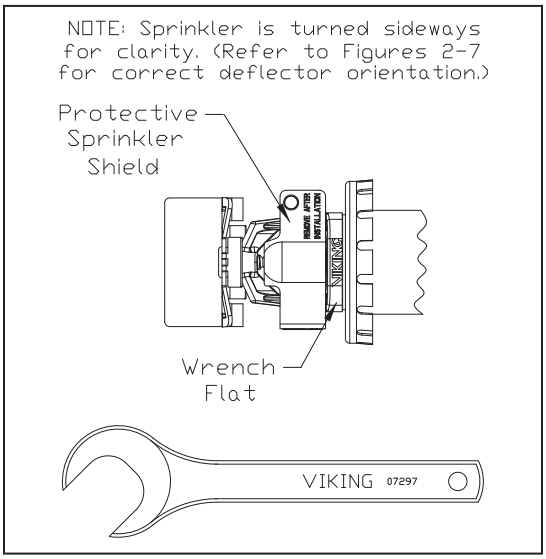


Figure 1:
Standard Sprinkler Wrench 07297W/B

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

5. OPERATION

During fire conditions, the heat-sensitive liquid in the glass bulb expands, causing the glass to shatter, releasing the internal parts to open the waterway. Water flowing through the sprinkler orifice strikes the sprinkler deflector, forming a uniform spray pattern to extinguish or control the fire.

6. INSPECTIONS, TESTS AND MAINTENANCE

Refer to NFPA 25 for Inspection, Testing and Maintenance requirements.

7. AVAILABILITY

The Viking Quick Response Dry Horizontal Sidewall Sprinkler is available through a network of domestic and international distributors. See The Viking Corporation web site for the closest distributor or contact The Viking Corporation.

8. GUARANTEE

For details of warranty, refer to Viking's current list price schedule or contact Viking directly.

TABLE 1: AVAILABLE SPRINKLER TEMPERATURE RATINGS AND FINISHES

Sprinkler Temperature Classification	Sprinkler Nominal Temperature Rating[1]	Maximum Ambient Ceiling Temperature[2]	Bulb Color
Ordinary	155 °F (68 °C)	100 °F (38 °C)	Red
Intermediate	175 °F (79 °C)	150 °F (65 °C)	Yellow
Intermediate	200 °F (93 °C)	150 °F (65 °C)	Green
High	286 °F (141 °C)	225 °F (107 °C)	Blue

Sprinkler Finishes: Brass, Chrome, White Polyester, and ENT
Corrosion-Resistant Coating[3,4]: White Polyester and ENT in all temperature ratings

Footnotes

[1] The sprinkler temperature rating is stamped on the deflector.

[2] Based on NFPA-13. Other limits may apply, depending on fire loading, sprinkler location, and other requirements of the Authority Having Jurisdiction. Refer to specific installation standards.

[3] **The corrosion-resistant Polyester and ENT coatings have passed the standard corrosion test required by the approving agencies indicated in the Approval Charts. These tests cannot and do not represent all possible corrosive environments. Note: These coatings are NOT corrosion proof. Prior to installation, verify through the end-user that the coatings are compatible with or suitable for the proposed environment. Polyester and ENT coatings are applied to the exposed exterior surfaces only. Note that the spring is exposed on sprinklers with Polyester and ENT coatings.**

[4] **When installed in some corrosive environments, the Polyester finish may change color. This natural discoloration over time is not in itself an indication of corrosion and should not be treated as such. All sprinklers installed in corrosive environments should be replaced or tested as described in NFPA 25 on a more frequent basis.**

QUICK RESPONSE DRY HORIZONTAL SIDEWALL SPRINKLERS

TECHNICAL DATA

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

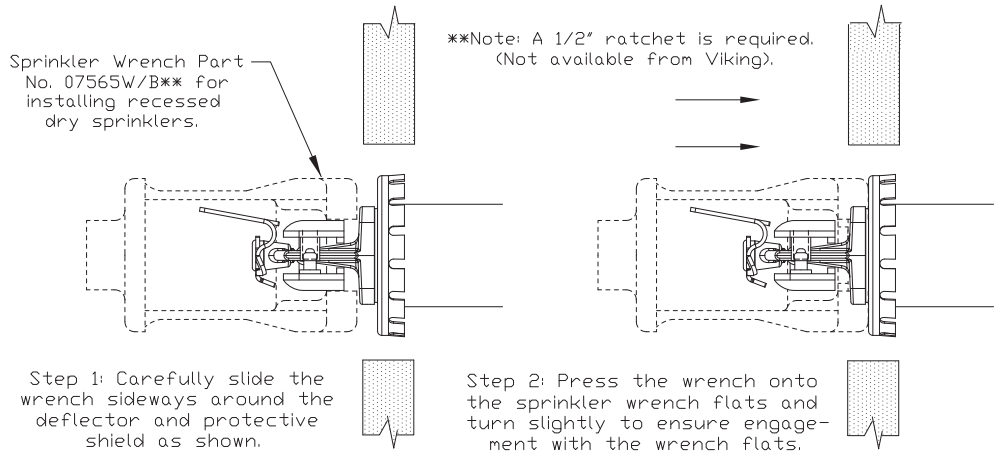


Figure 2: Wrench 07565W/B for Adjustable Recessed Dry Horizontal Sidewall Sprinklers

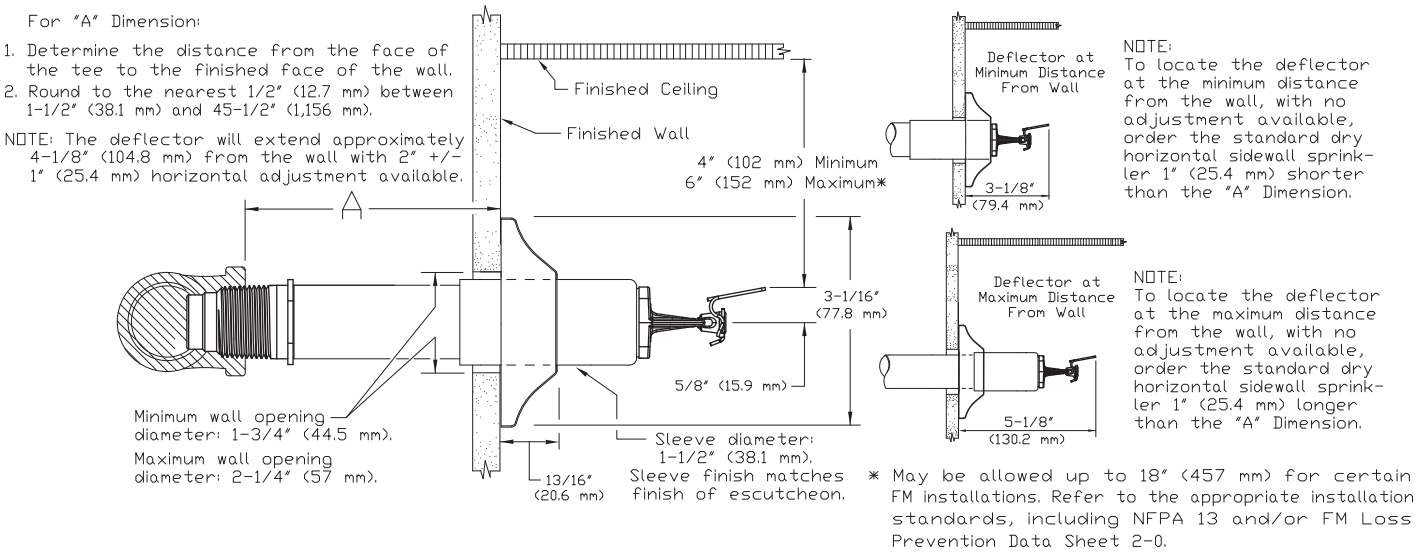


Figure 3: Adjustable Standard Dry Horizontal Sidewall Sprinkler

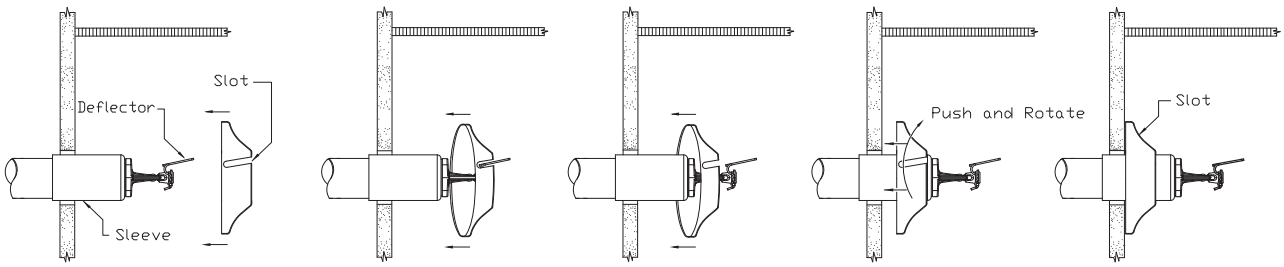


Figure 4: Adjustable Standard Escutcheon Installation

VIKING®

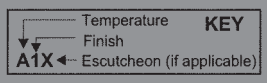
TECHNICAL DATA

QUICK RESPONSE DRY HORIZONTAL SIDEWALL SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

Approval Chart 1 (UL)

Quick Response Dry Horizontal Sidewall Sprinklers
For Light Hazard Occupancies Only
Maximum 175 PSI (12 bar) WWP



Sprinkler Base Part No.[1]	SIN	Style	Thread Size		Nominal K-Factor[2]		Order Length Increment		Listings and Approvals[4] (Refer also to Design Criteria on page 106e.)					
			NPT	BSP	U.S.	metric[3]	Inches	mm	cULus[5]	NYC[6]	VdS	LPCB	CE	
08384U	VK178	Adjustable Standard	1”	--	5.6	80.6	1/2”	12.7	A1, A5	A1	--	--	--	--
16458U			--	25 mm	--	80.6	1/2”	12.7	A1, A5	--	--	--	--	--
08386U	VK182	Adjustable Recessed	1”	--	5.6	80.6	1/4”	6.35	B2, B6	B2	--	--	--	--
16454U			--	25 mm	--	80.6	1/4”	6.35	B2, B6	--	--	--	--	--
08388U	VK174	Plain Barrel	1”	--	5.6	80.6	1/2”	12.7	A3	A4	--	--	--	--
16456U			--	25 mm	--	80.6	1/2”	12.7	A3	--	--	--	--	--

Approved Temperature Ratings

A - 155 °F (68 °C), 175 °F (79°C), 200 °F (93 °C), and 286 °F (141 °C)
B - 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)

Approved Finishes and “A” Dimensions

1* - Chrome, or White Polyester[7] sprinkler with a Chrome, Brass, or White Polyester Sleeve and Escutcheon with “A” dimensions 1-1/2” to 45-1/2” (38.1 mm to 1,156 mm)
2* - Chrome, or White Polyester[7] with “A” dimensions 3-1/4” to 47-1/2” (82.5 mm to 1,207 mm)
3 - Chrome, Brass, White Polyester[7], or ENT[7] with “A” dimensions 3” to 47” (76.2 mm to 1,194 mm)
4 - Chrome or Brass with “A” dimensions 3” to 47” (76.2 mm to 1,194 mm)
5 - ENT[7] sprinkler with an ENT[7] Sleeve and Escutcheon with “A” dimensions 1-1/2” to 45-1/2” (38.1 mm to 1,156 mm)
6 - ENT[7] with “A” dimensions 3-1/4” to 47-1/2” (82.5 mm to 1,207 mm)

*Brass Finish is listed and approved but not standard offering, lead times of 6-8 weeks required.
(Matching Brass escutcheons are not available.)

Footnotes

[1] Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
[2] K-Factor applies for standard lengths (“A” Dimensions indicated above).
[3] Metric K-factor shown is for use when pressure is measured in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[4] This chart shows the listings and approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals.
[5] Listed by Underwriter’s Laboratories for use in the U.S. and Canada for Light Hazard occupancies only.
[6] Accepted for use, City of New York Department of Buildings, MEA Number 89-92-E, Vol. 15.
[7] cULus Listed as corrosion resistant.

DESIGN CRITERIA - UL

(Also refer to Approval Chart 1 above.)

NOTE: When using CPVC fittings with Viking dry sprinklers, use only new Nibco Model 5012-S-Bl tees. When selecting other CPVC fittings, contact Viking Technical Services.

cULus Listing Requirements:

Quick Response Dry Horizontal Sidewall Sprinklers are cULus Listed as indicated in Approval Chart 1 for installation in accordance with the latest edition of NFPA 13 for standard spray sprinklers.

- Limited to Light Hazard occupancies only.
- Protection areas and maximum spacing shall be in accordance with the tables provided in NFPA 13.
- Minimum spacing allowed is 6 ft. (1.8 m).
- Deflector must be positioned between 4” and 6” (102 mm and 152 mm) below the ceiling. Keep the top of the deflector oriented parallel with the ceiling.
- Locate no less than 4” (102 mm) from end walls.
- Maximum distance from end walls shall be no more than one-half of the allowable distance between sprinklers. The distance shall be measured perpendicular to the wall.
- The sprinkler installation and obstruction rules contained in NFPA 13 for sidewall standard spray sprinklers must be followed.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page DRY1-3 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

VIKING®

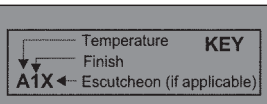
TECHNICAL DATA

QUICK RESPONSE DRY HORIZONTAL SIDEWALL SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

Approval Chart 2 (FM)

Quick Response Dry Horizontal Sidewall Sprinklers
For Light Hazard Occupancies Only
Maximum 175 PSI (12 bar) WWP



Sprinkler Base Part No.[1]	SIN	Style	Thread Size		Nominal K-Factor[2]		Order Length Increment		FM Approvals[4] (Refer also to Design Criteria below.)
			NPT	BSP	U.S.	metric[3]	Inches	mm	
08384U	VK178	Adjustable Standard	1”	--	5.6	80.6	1/2”	12.7	A1
16458U			--	25 mm	--	80.6	1/2”	12.7	A1
08386U	VK182	Adjustable Recessed	1”	--	5.6	80.6	1/4”	6.35	B2
16454U			--	25 mm	--	80.6	1/4”	6.35	B2
08388U	VK174	Plain Barrel	1”	--	5.6	80.6	1/2”	12.7	A3
16456U			--	25 mm	--	80.6	1/2”	12.7	A3

Approved Temperature Ratings

A - 155 °F (68 °C), 175 °F (79 °C), 200 °F (93 °C), and 286 °F (141 °C)
B - 155 °F (68 °C), 175 °F (79 °C), and 200 °F (93 °C)

Approved Finishes and “A” Dimensions

1* - Bright Brass, Chrome, White Polyester, or ENT[5] with “A” dimensions 1-1/2” to 45-1/2” (38.1 mm to 1,156 mm)
2* - Bright Brass, Chrome, White Polyester, or ENT[5] with “A” dimensions 3-1/4” to 47-1/2” (82.5 mm to 1,207 mm)
3 - Brass, Bright Brass, Chrome, White Polyester, or ENT[5] “A” dimensions 3” to 47” (76.2 mm to 1,194 mm)

*Brass Finish is listed and approved but not standard offering, lead times of 6-8 weeks required.
(Matching Brass escutcheons are not available.)

Footnotes

[1] Part number shown is the base part number. For complete part number, refer to current Viking price list schedule.
[2] K-Factor applies for standard lengths (“A” Dimensions indicated above).
[3] Metric K-factor shown is for use when pressure is measured in bar. When pressure is measured in kPa, divide the metric K-factor shown by 10.0.
[4] This chart shows the FM Approvals available at the time of printing. Other approvals may be in process. Check with the manufacturer for any additional approvals.
[5] FM approved as corrosion resistant.

DESIGN CRITERIA - FM

(Also refer to Approval Chart 2 above.)

NOTE: When using CPVC fittings with Viking dry sprinklers, use only new Nibco Model 5012-S-Bl tees. When selecting other CPVC fittings, contact Viking Technical Services.

FM Approval Requirements:

The Dry HSW Sprinklers in the Approval Chart above are FM Approved as quick response **Non-storage** standard spray sprinklers as indicated in the FM Approval Guide. For specific application and installation requirements, reference the latest applicable FM Loss Prevention Data Sheets (including 2-0) and Technical Advisory Bulletins. FM Global Loss Prevention Data Sheets and Technical Advisory Bulletins contain guidelines relating to, but not limited to: minimum water supply requirements, hydraulic design, ceiling slope and obstructions, minimum and maximum allowable spacing, and deflector distance below the ceiling.

NOTE: The FM installation guidelines may differ from cULus and/or NFPA criteria.

IMPORTANT: Always refer to Bulletin Form No. F_091699 - Care and Handling of Sprinklers. Also refer to page DRY1-3 for general care, installation, and maintenance information. Viking sprinklers are to be installed in accordance with the latest edition of Viking technical data, the appropriate standards of NFPA, FM Global, LPCB, APSAD, VdS or other similar organizations, and also with the provisions of governmental codes, ordinances, and standards, whenever applicable.

TECHNICAL DATA

QUICK RESPONSE DRY HORIZONTAL SIDEWALL SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

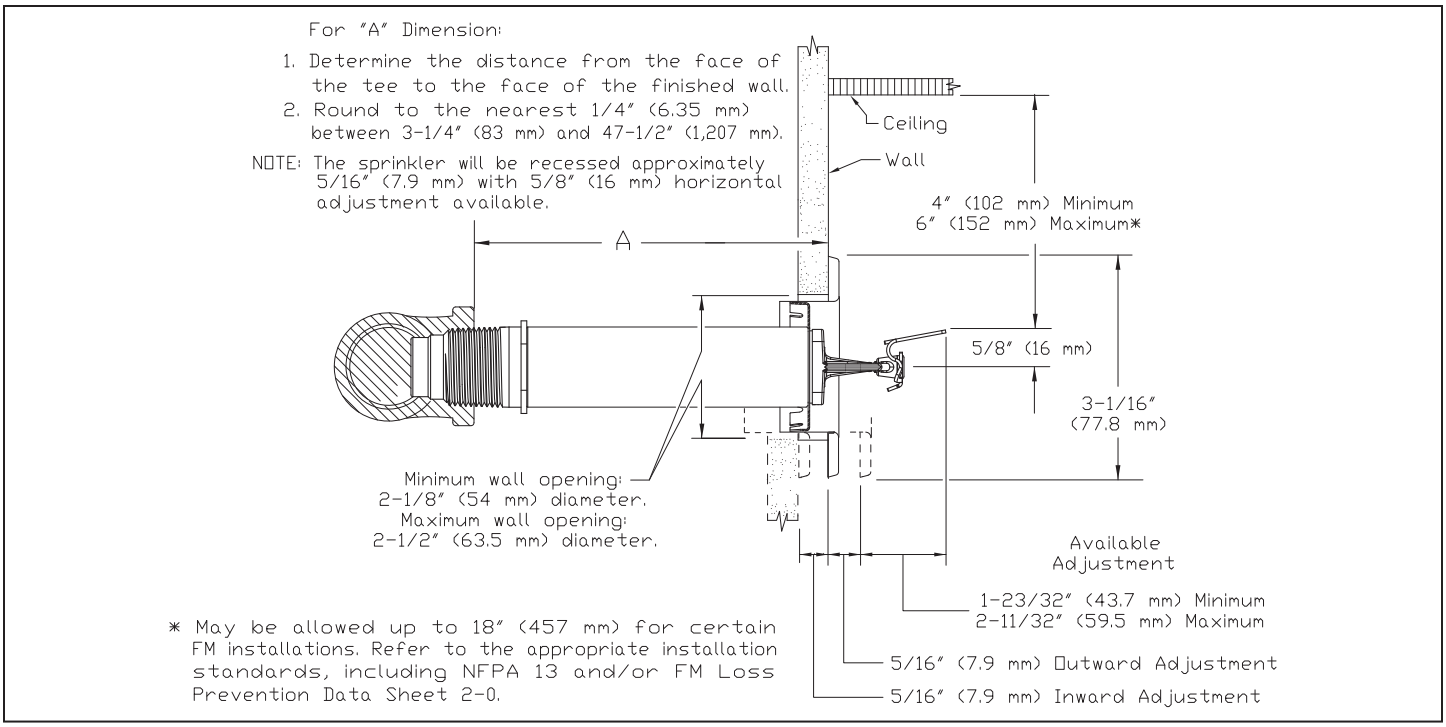


Figure 5: **Adjustable Recessed Dry Horizontal Sidewall Sprinkler with the Model E-1 Escutcheon**

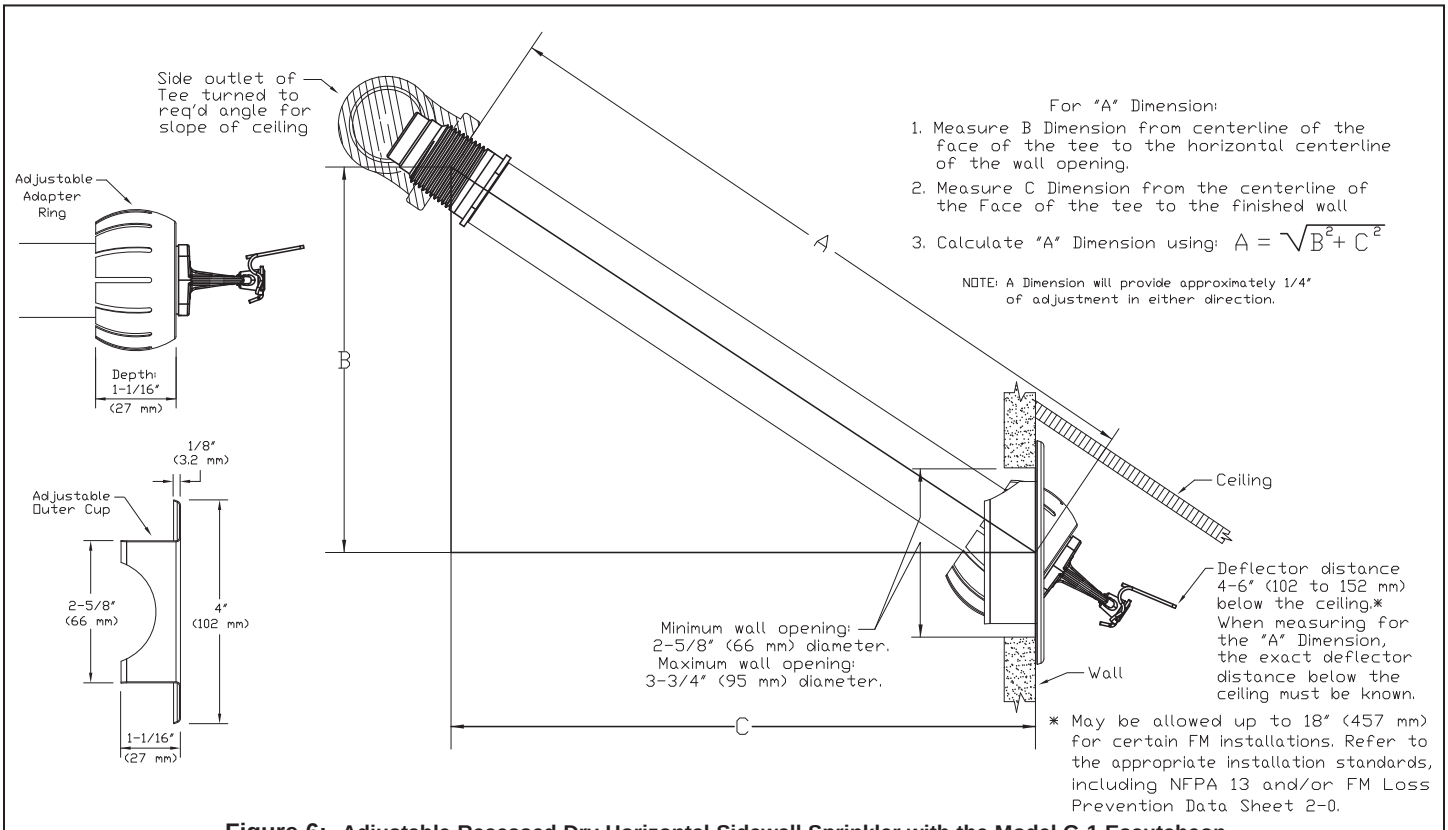


Figure 6: **Adjustable Recessed Dry Horizontal Sidewall Sprinkler with the Model G-1 Escutcheon**

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

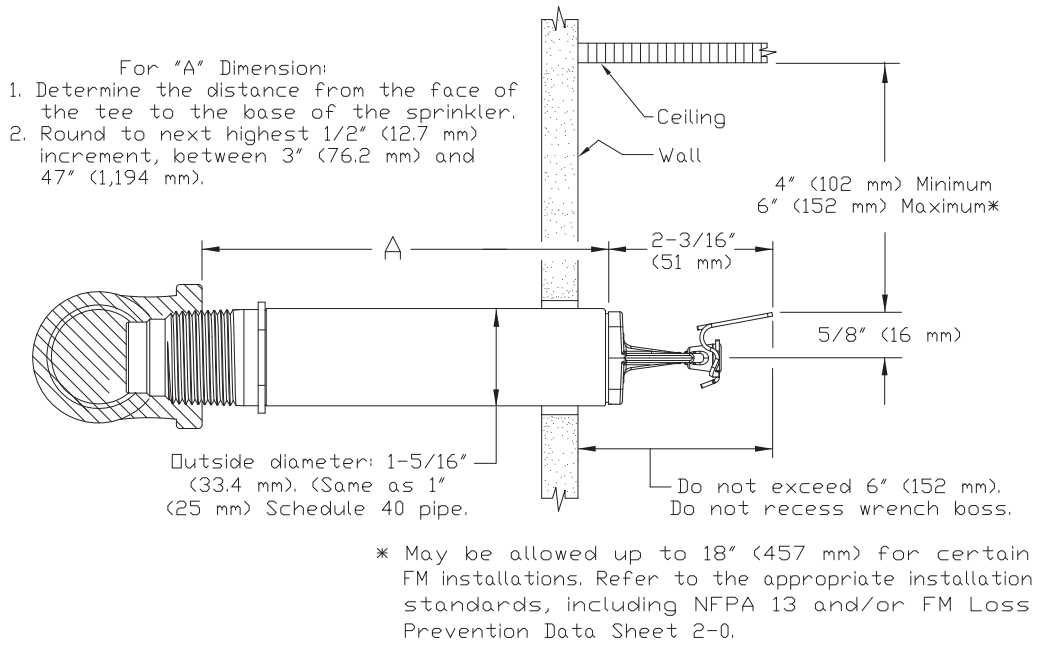


Figure 7: Quick Response Plain Barrel Dry Horizontal Sidewall Sprinkler

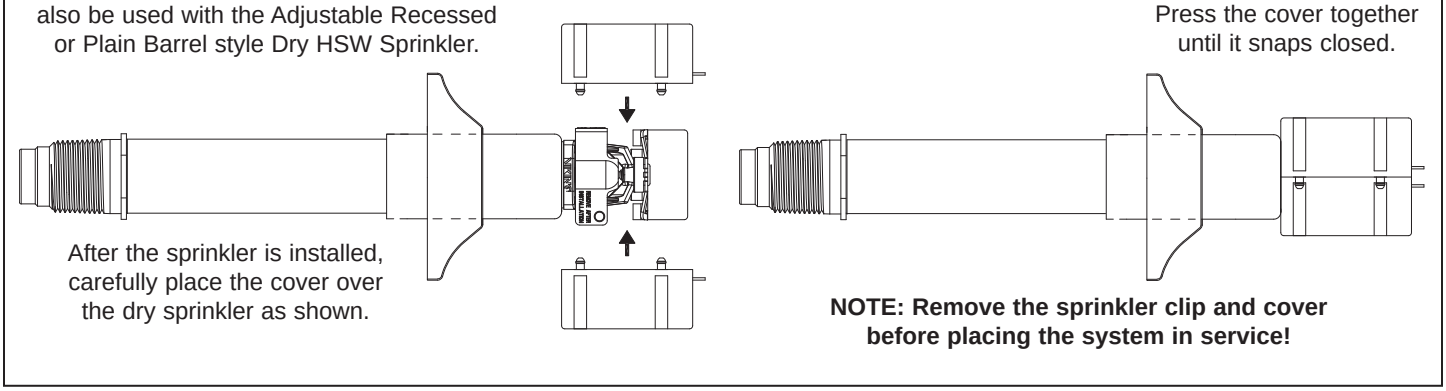
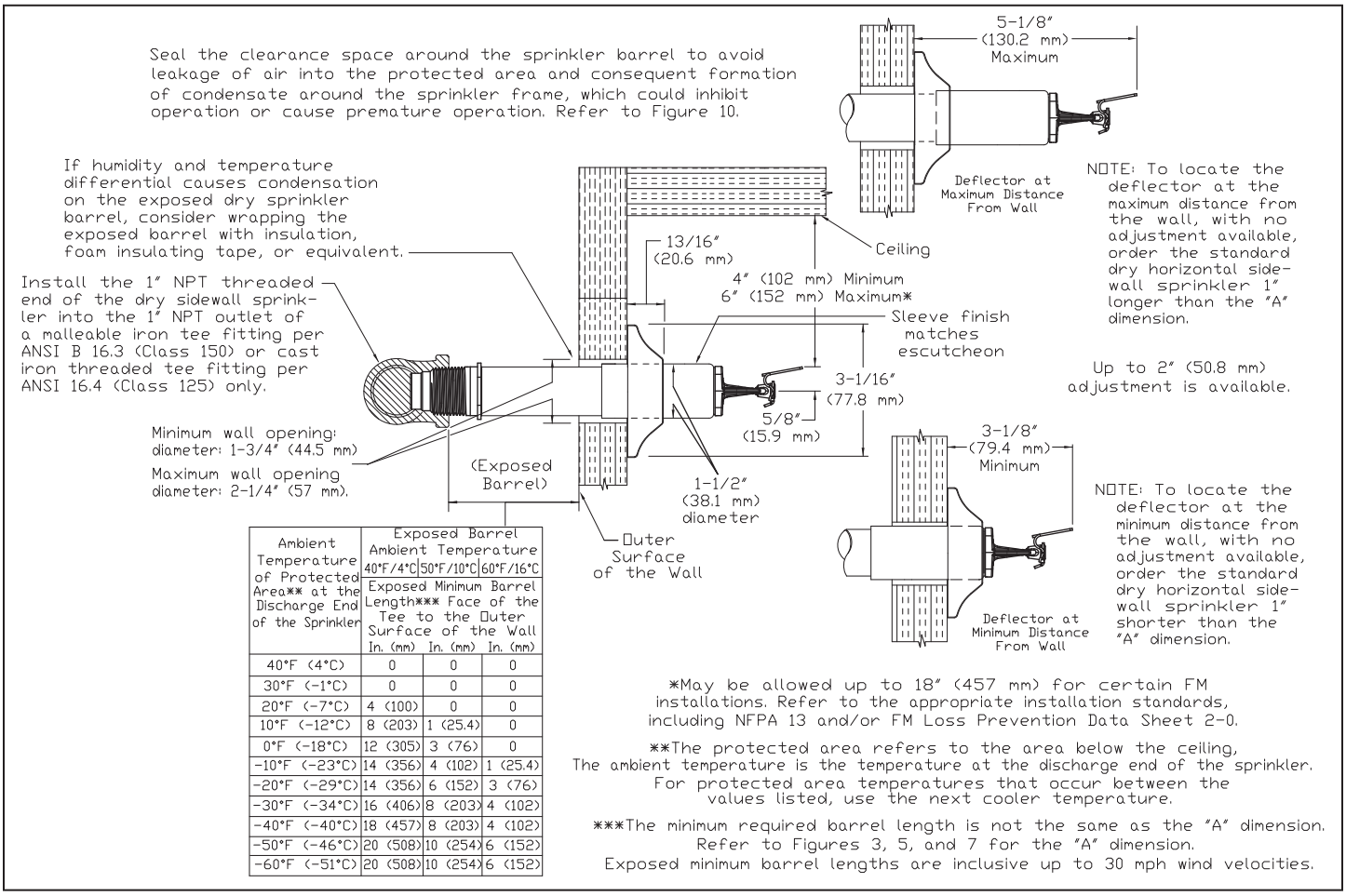


Figure 8: Dry Horizontal Sidewall Sprinkler Cover Part Number 15610 (shown with an Adjustable Standard Dry HSW Sprinkler) (Optional for temporary use with Viking Dry HSW Sprinklers until finish work is completed around the sprinkler.)

TECHNICAL DATA

QUICK RESPONSE DRY HORIZONTAL SIDEWALL SPRINKLERS

The Viking Corporation, 210 N Industrial Park Drive, Hastings MI 49058
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com



Ambient Temperature of Protected Area** at the Discharge End of the Sprinkler	Exposed Barrel Ambient Temperature 40°F/4°C	50°F/10°C	60°F/16°C
	Exposed Minimum Barrel Length*** Face of the Tee to the Outer Surface of the Wall In. (mm)	In. (mm)	In. (mm)
40°F (4°C)	0	0	0
30°F (-1°C)	0	0	0
20°F (-7°C)	4 (100)	0	0
10°F (-12°C)	8 (203)	1 (25.4)	0
0°F (-18°C)	12 (305)	3 (76)	0
-10°F (-23°C)	14 (356)	4 (102)	1 (25.4)
-20°F (-29°C)	14 (356)	6 (152)	3 (76)
-30°F (-34°C)	16 (406)	8 (203)	4 (102)
-40°F (-40°C)	18 (457)	8 (203)	4 (102)
-50°F (-46°C)	20 (508)	10 (254)	6 (152)
-60°F (-51°C)	20 (508)	10 (254)	6 (152)

*May be allowed up to 18" (457 mm) for certain FM installations. Refer to the appropriate installation standards, including NFPA 13 and/or FM Loss Prevention Data Sheet 2-0.

**The protected area refers to the area below the ceiling, The ambient temperature is the temperature at the discharge end of the sprinkler. For protected area temperatures that occur between the values listed, use the next cooler temperature.

***The minimum required barrel length is not the same as the "A" dimension. Refer to Figures 3, 5, and 7 for the "A" dimension. Exposed minimum barrel lengths are inclusive up to 30 mph wind velocities.

Figure 9: **Dry Horizontal Sidwall Sprinkler Required Minimum Barrel Length Based on Ambient Temperature in the Protected Area (Adjustable Standard Dry HSW Sprinkler is Shown)**

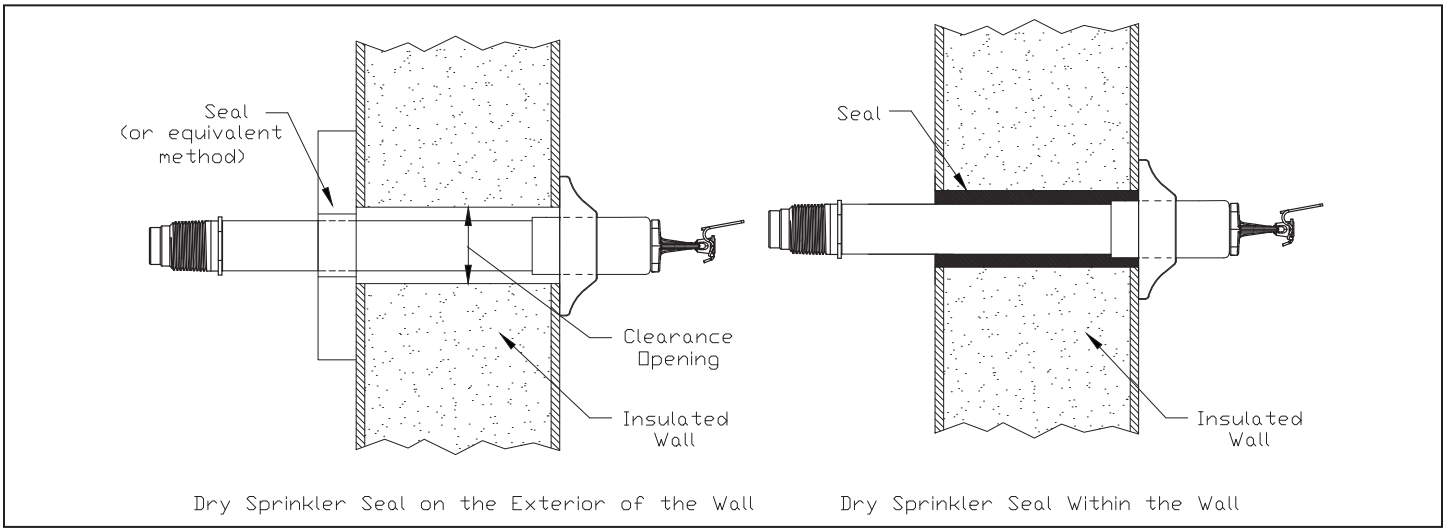


Figure 10: **Dry Sprinkler Seal (Adjustable Standard Dry HSW Sprinkler is Shown)**

Reliable®

Models DD56-6, DD56-27, DD80-6, DD80-27, DS56, GP56, AH42, & AH56 Sprinklers

Specific Application Sprinklers for Attic Spaces

cULus Listed

Features

- Coverage for DD80 spans up to 70 ft (21 m) with one row of sprinklers
- Coverage for DD80 spans up to 100 ft (30.5 m) with three rows of sprinklers
- All models use a 212°F (100°C) temperature rated fusible-link operating element
- 150 square foot per sprinkler protection using GP56 and AH Series sprinklers

Product Description

Reliable Attic Sprinklers are cULus Listed Specific Application sprinklers. The sprinklers are available for protection of combustible and non-combustible light hazard concealed spaces with roof slopes of 4:12 to 8:12, and in some cases up to 12:12. Reliable Attic Sprinklers are upright sprinklers listed for use on wet-pipe or dry-pipe sprinkler systems. All Reliable Attic sprinklers use a 212°F (100°C) temperature rated fusible-link operating element that is Listed for installation where the maximum ceiling temperature is up to 150°F (66°C). Table A provides a summary of available Reliable Attic sprinklers.

Application

Reliable Attic Sprinklers are listed for installation in accordance with this bulletin and NFPA 13, "Standard for the Installation of Fire Sprinklers." The sprinklers are classified as Special Sprinklers by NFPA 13, and are intended for installation within combustible or noncombustible roof structures, including those with wooden trusses. Coverage area, spacing requirements, and design flow and pressure for each sprinkler are provided in tables B-I on the individual sprinkler data sheets in this bulletin. Example sprinkler layouts and hydraulic design criteria are provided in Figures 9 through 26. Please note that the example sprinkler layouts are intended as design aids only, and do not necessarily reflect all possible construction methods. In some cases, a combination of layouts may be required. The Authority Having Jurisdiction should be consulted for situations that are not specifically addressed within this bulletin.

Important! Reliable fire sprinklers must be handled, stored, and installed in accordance with the guidelines in Caution Sheet 310 and this bulletin. Failure to follow these instructions may result in unintended operation or nonoperation of the fire protection system.

Model DD56
(Model DD80 similar)

Model DS56

Model GP56

Model AH56
(Model AH42 similar)

Special Note Regarding Insulation

Noncombustible insulation, properly secured with wire netting to prevent sagging onto sprinklers may be used at the roof deck. Spray foam has not been evaluated for use with attic sprinklers. Use of spray foam insulation with attic sprinklers should be evaluated on a case by case basis with the Authority Having Jurisdiction.

Attic Sprinkler Summary — **Table A**

Sprinkler Model	K-Factor gpm/psi$^{1/2}$ (L/min/bar$^{1/2}$)	Thread Size NPT or ISO7-1	Max. Coverage Area (Measured on Floor) ft x ft (m x m)	Roof Slope	Design Criteria	Sprinkler Identification Number (SIN)
DD56-6	5.6 (80)	½	6 x 40 (1.8 x 12)	4:12 to <6:12	Table B	RA5624
DD56-27	5.6 (80)	½	6 x 40 (1.8 x 12)	6:12 to 8:12	Table C	RA5694
DD80-6	8.0 (115)	¾	6 x 66 or 5 x 70 (1.8 x 20 or 1.5 x 21)	4:12 to <6:12	Table D	RA5622
DD80-27	8.0 (115)	¾	6 x 66 or 5 x 70 (1.8 x 20 or 1.5 x 21)	6:12 to 8:12	Table E	RA5692
DS56	5.6 (80)	½	6 x 40 (1.8 x 12)	4:12 to 12:12*	Table F	RA5625
GP56	5.6 (80)	½	10 x 15 (3.0 x 4.6)	4:12 to 12:12*	Table G	RA5695
AH42	4.2 (60)	½	10 x 15 (3.0 x 4.6)	4:12 to 12:12*	Table H	RA5623
AH56	5.6 (80)	½	10 x 15 (3.0 x 4.6)	4:12 to 12:12*	Table I	RA5626

***Note:** Use in spaces with slopes over 8:12 is limited to particular areas; refer to supplemental information pages. Use in the main attic area is limited to slopes not exceeding 8:12.

Model DD56-6 Specific Application Sprinkler — SIN RA5624

Technical Specifications
Style: Upright
Orientation: Deflector horizontal
Threads: 1/2" NPT or ISO 7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 175 psi (12 bar)
Sprinkler Temperature Rating: 212°F (100°C)
Sensitivity: Quick-response

Hydraulic Design Criteria
(See Table B and Figures 9 - 26)

Finish
Brass

Sprinkler Wrench
Model W2

Material Specifications
Thermal Sensor: Nickel Alloy Solder Link
Levers: Stainless Steel
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Button Clip: Stainless Steel
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Listings and Approvals
cULus Listed

Hazard Classification
Light Hazard

System Types
Wet-pipe with steel or Listed CPVC pipe
Dry-pipe with steel pipe

Installation Criteria
Sprinkler Spacing
Minimum 4 ft (1.2 m), maximum 6 ft (1.8m) between sprinklers along ridge
Minimum 26 ft (7.9 m) down the roof slope toward eave to nearest sprinkler, measured parallel to the roof deck

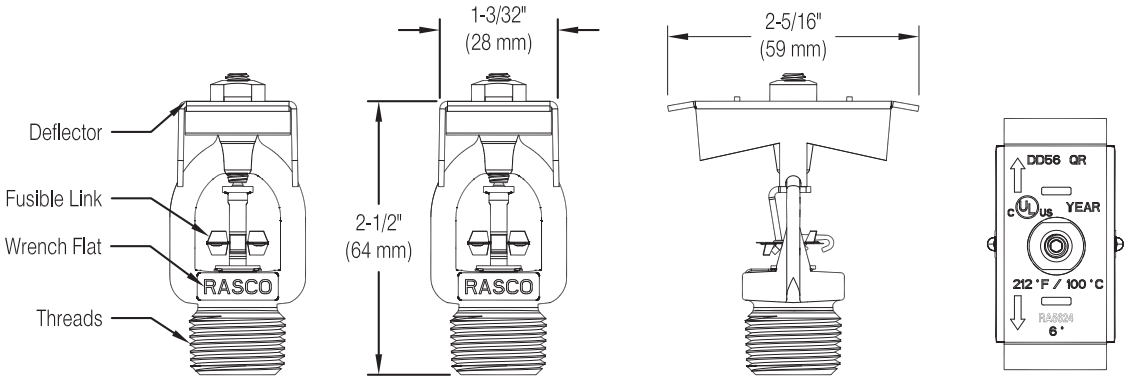
Horizontal Distance from Face of Truss
Min: 6 inches (150 mm)

Vertical Distance of Deflector Above Scissor Truss
Min: 18 inches (450 mm)

Horizontal Distance from Center-line of Ridge
Max: 6 inches (150 mm)

Vertical Distance of Top of Deflector Below Peak, Ridge, or Deck
Min: 17 inches (430 mm)
Max: 21 inches (530 mm)

Model DD56-6 Sprinkler Components and Dimensions — Figure 1



Model DD56-6 Minimum Required Flow and Residual Pressure — Table B

Ceiling Slope	Max. Coverage Area ft x ft (m x m)	Flow gpm (l/min)	Pressure psi (bar)
4:12 to less than 6:12[1]	6 x 40[2] (1.8 x 12)	25 (95)	19.9 (1.37)

Notes:
1. For the singular instance of an asymmetrical pitch of 4:12 to less than 6:12 on one side of a ridge and a pitch of 6:12 on the opposite side of the ridge, use of the Model DD56-6 is acceptable. For all other pitches of 6:12 up to 8:12, refer to the Model DD56-27.
2. Long dimension of coverage area to be along the roof slope parallel to trusses. Length of coverage area is split equally to each side of the sprinkler at the ridge. Coverage area is measured parallel to the floor.

Model DD56-27 Specific Application Sprinkler — SIN RA5694

Technical Specifications
Style: Upright
Orientation: Deflector horizontal
Threads: 1/2" NPT or ISO 7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 175 psi (12 bar)
Sprinkler Temperature Rating: 212°F (100°C)
Sensitivity: Quick-response

Hydraulic Design Criteria
(See Table C and Figures 9 - 26)

Finish
Brass

Sprinkler Wrench
Model W2

Material Specifications
Thermal Sensor: Nickel Alloy Solder Link
Levers: Stainless Steel
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Button Clip: Stainless Steel
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Listings and Approvals
cULus Listed

Hazard Classification
Light Hazard

System Types
Wet-pipe with steel or Listed CPVC pipe
Dry-pipe with steel pipe

Installation Criteria
Sprinkler Spacing
Minimum 4 ft (1.2 m), maximum 6 ft (1.8m) between sprinklers along ridge
Minimum 26 ft (7.9 m) down the roof slope toward eave to nearest sprinkler, measured parallel to the roof deck

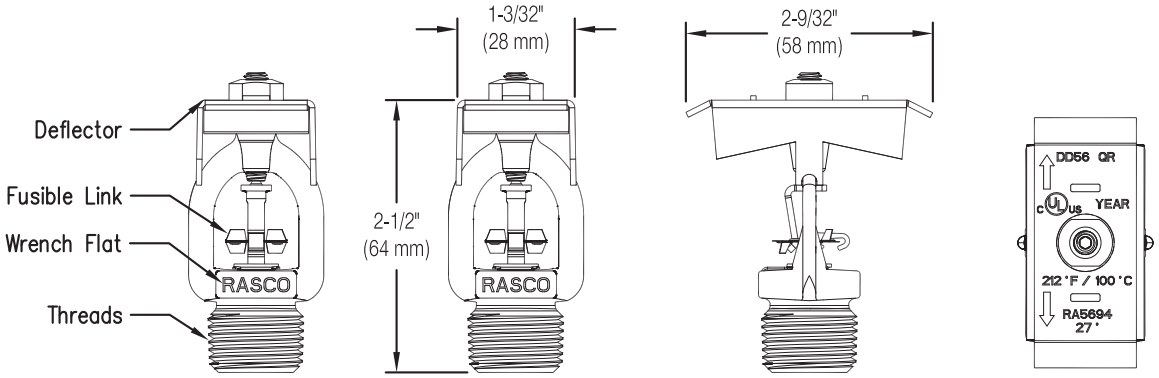
Horizontal Distance from Face of Truss
Min: 6 inches (150 mm)

Vertical Distance of Deflector Above Scissor Truss
Min: 18 inches (450 mm)

Horizontal Distance from Center-line of Ridge
Max: 6 inches (150 mm)

Vertical Distance of Top of Deflector Below Peak, Ridge, or Deck
Min: 17 inches (430 mm)
Max: 21 inches (530 mm)

Model DD56-27 Sprinkler Components and Dimensions — **Figure 2**



Model DD56-27 Minimum Required Flow and Residual Pressure — **Table C**

Ceiling Slope	Max. Coverage Area[1] ft x ft (m x m)	Flow gpm (l/min)	Pressure psi (bar)
6:12 to 8:12	6 x 40 (1.8 x 12)	25 (95)	19.9 (1.37)

Notes:
1. Long dimension of coverage area to be along the roof slope parallel to trusses. Length of coverage area is split equally to each side of the sprinkler at the ridge. Coverage area is measured parallel to the floor.

Model DD80-6 Specific Application Sprinkler — SIN RA5622

Technical Specifications
Style: Upright
Orientation: Deflector horizontal
Threads: 3/4" NPT or ISO 7-1R3/4
Nominal K-Factor: 8.0 (115 metric)
Max. Working Pressure: 175 psi (12 bar)
Sprinkler Temperature Rating: 212°F (100°C)
Sensitivity: Quick-response

Hydraulic Design Criteria
(See Table D and Figures 9 - 26)

Finish
Brass

Sprinkler Wrench
Model W2

Material Specifications
Thermal Sensor: Nickel Alloy Solder Link
Levers: Stainless Steel
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Button Clip: Stainless Steel
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Listings and Approvals
cULus Listed

Hazard Classification
Light Hazard

System Types
Wet-pipe with steel or Listed CPVC pipe
Dry-pipe with steel pipe

Installation Criteria
Sprinkler Spacing
Minimum 4 ft (1.2 m), maximum 6 ft (1.8m) between sprinklers along ridge
Minimum 26 ft (7.9 m) down the roof slope toward eave to nearest sprinkler, measured parallel to the roof deck

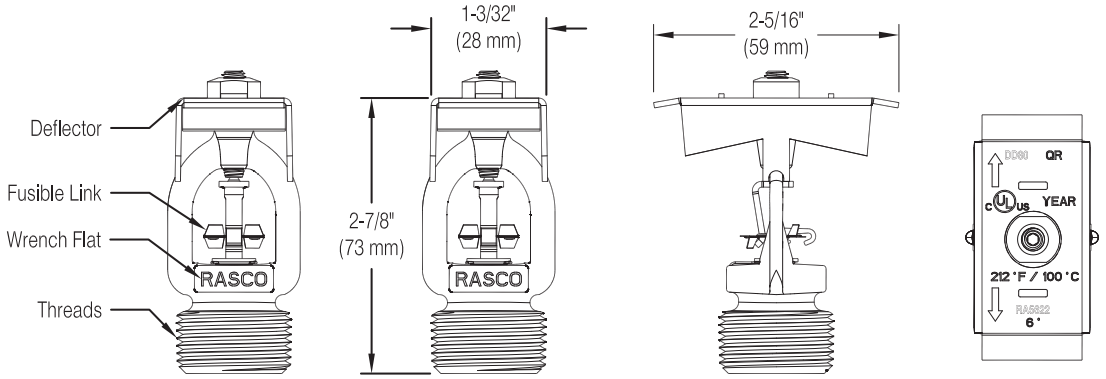
Horizontal Distance from Face of Truss
Min: 6 inches (150 mm)

Vertical Distance of Deflector Above Scissor Truss
Min: 18 inches (450 mm)

Horizontal Distance from Center-line of Ridge
Max: 6 inches (150 mm)

Vertical Distance of Top of Deflector Below Peak, Ridge, or Deck
Min: 17 inches (430 mm)
Max: 21 inches (530 mm)

Model DD80-6 Sprinkler Components and Dimensions — Figure 3



Model DD80-6 Minimum Required Flow and Residual Pressure — Table D

Ceiling Slope	Max. Coverage Area ft x ft (m x m)	Flow gpm (l/min)	Pressure psi (bar)
4:12 to less than 6:12[1]	6 x 40 (1.8 x 12)[2]	25 (95)	9.8 (0.68)
	6 x 63 (1.8 x 19)[2]	38 (144)	22.6 (1.56)
	6 x 66 (1.8 x 20)[2]	40 (151)	25 (1.72)
	5 x 70 (1.5 x 21)[2]	38 (144)	22.6 (1.56)

Notes:
1. For the singular instance of an asymmetrical pitch of 4:12 to less than 6:12 on one side of a ridge and a pitch of 6:12 on the opposite side of the ridge, use of the Model DD80-6 is acceptable. For all other pitches of 6:12 up to 8:12, refer to the Model DD80-27.
2. Long dimension of coverage area to be along the roof slope parallel to trusses. Length of coverage area is split equally to each side of the sprinkler at the ridge. Coverage area is measured parallel to the floor.

Model DD80-27 Specific Application Sprinkler — SIN RA5692

Technical Specifications
Style: Upright
Orientation: Deflector horizontal
Threads: 3/4" NPT or ISO 7-1R3/4
Nominal K-Factor: 8.0 (115 metric)
Max. Working Pressure: 175 psi (12 bar)
Sprinkler Temperature Rating: 212°F (100°C)
Sensitivity: Quick-response

Hydraulic Design Criteria
(See Table E and Figures 9 - 26)

Finish
Brass

Sprinkler Wrench
Model W2

Material Specifications
Thermal Sensor: Nickel Alloy Solder Link
Levers: Stainless Steel
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Button Clip: Stainless Steel
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Listings and Approvals
cULus Listed

Hazard Classification
Light Hazard

System Types
Wet-pipe with steel or Listed CPVC pipe
Dry-pipe with steel pipe

Installation Criteria
Sprinkler Spacing
Minimum 4 ft (1.2 m), maximum 6 ft (1.8m) between sprinklers along ridge
Minimum 26 ft (7.9 m) down the roof slope toward eave to nearest sprinkler, measured parallel to the roof deck

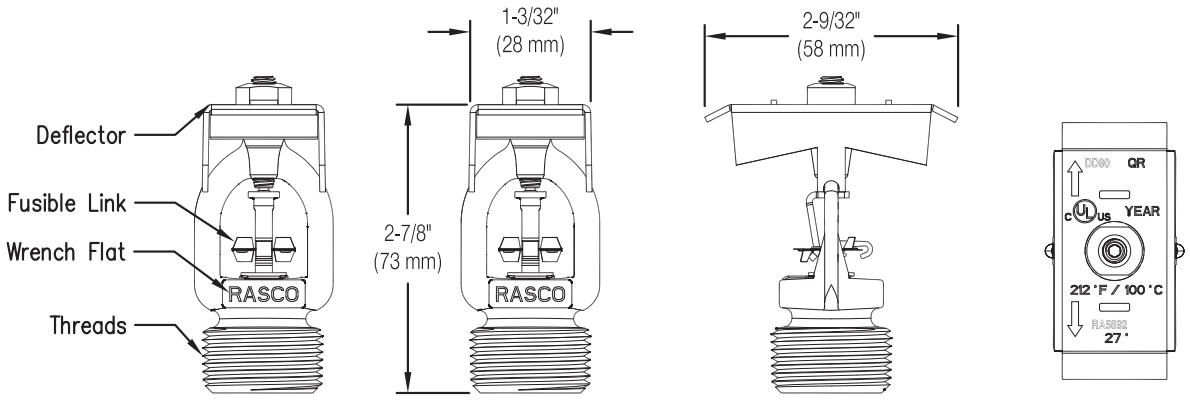
Horizontal Distance from Face of Truss
Min: 6 inches (150 mm)

Vertical Distance of Deflector Above Scissor Truss
Min: 18 inches (450 mm)

Horizontal Distance from Center-line of Ridge
Max: 6 inches (150 mm)

Vertical Distance of Top of Deflector Below Peak, Ridge, or Deck
Min: 17 inches (430 mm)
Max: 21 inches (530 mm)

Model DD80-27 Sprinkler Components and Dimensions — Figure 4



Model DD80-27 Minimum Required Flow and Residual Pressure — Table E

Ceiling Slope	Max. Coverage Area[1] ft x ft (m x m)	Flow gpm (l/min)	Pressure psi (bar)
6:12 to 8:12	6 x 40 (1.8 x 12)	28 (106)	12.3 (0.85)
	6 x 63 (1.8 x 19)	38 (144)	22.6 (1.56)
	6 x 66 (1.8 x 20)	40 (151)	25 (1.72)
	5 x 70 (1.5 x 21)	38 (144)	22.6 (1.56)

Notes:
1. Long dimension of coverage area to be along the roof slope parallel to trusses. Length of coverage area is split equally to each side of the sprinkler at the ridge. Coverage area is measured parallel to the floor.

Model DS56 Specific Application Sprinkler — SIN RA5625

Technical Specifications
Style: Upright
Orientation: Frame arms perpendicular to roof deck
Threads: 1/2" NPT or ISO 7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 175 psi (12 bar)
Sprinkler Temperature Rating: 212°F (100°C)
Sensitivity: Quick-response

Hydraulic Design Criteria
(See Table F and Figures 9 - 26)

Finish
Brass

Sprinkler Wrench
Model DS56

Material Specifications
Thermal Sensor: Nickel Alloy Solder Link
Levers: Brass Alloy
Frame Body: Brass Alloy
Frame Arms: Brass Alloy
Yoke: Copper Alloy
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Listings and Approvals
cULus Listed

Hazard Classification
Light Hazard

System Types
Wet-pipe with steel or Listed CPVC pipe
Dry-pipe with steel pipe

Installation Criteria
Sprinkler Spacing
Minimum 4 ft (1.2 m), maximum 6 ft (1.8m) between sprinklers along ridge
Minimum 26 ft (7.9 m) down the roof slope toward eave to nearest sprinkler, measured parallel to the roof deck

Horizontal Distance from Face of Truss
Min: 6 inches (150 mm)

Horizontal Distance from Draft Curtain or Wall (1)
Min: 30 inches (762 mm)
Max: 42 inches (1067 mm)

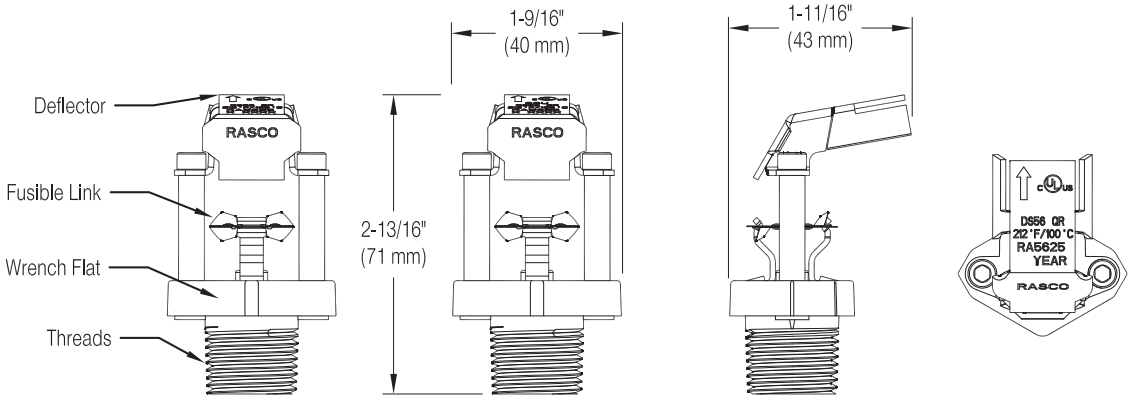
Vertical Distance of Top of Deflector Above Bottom of Draft Curtain
Min: 8 inches (200 mm)

Vertical Distance of Deflector Above Scissor Truss
Min: 18 inches (450 mm)

Distance from Top of Deflector to Roof Deck (measured perpendicular to roof deck)
Min: 9 inches (230 mm)
Max: 13 inches (330 mm)

(1) Model DS56 sprinklers may be installed back-to-back on opposite sides of a ridge where a draft curtain is installed to separate the back-to-back rows of sprinklers.

Model DS56 Sprinkler Components and Dimensions — **Figure 5**



Model DS56 Minimum Required Flow and Residual Pressure — **Table F**

Ceiling Slope	Max. Coverage Area(2) ft x ft (m x m)	Flow gpm (l/min)	Pressure psi (bar)
4:12 to 8:12(1)	6 x 30 (1.8 x 9.1)	23 (87)	16.9 (1.17)
	6 x 40 (1.8 x 12)	35 (132)	39.1 (2.70)

Notes:
1. Use in the main attic area is limited to slopes not exceeding 8:12, however, the Model DS56 may be used to protect hips, mansards, or similar single slope areas with slopes up to 12:12 where protection can be achieved with a single row of sprinklers.
2. Long dimension of coverage area to be along the roof slope parallel to trusses. Length of coverage area is from the draft curtain or wall behind the sprinkler toward the eave. Coverage area to be measured parallel to the floor.

Model GP56 Specific Application Sprinkler — SIN RA5695

Technical Specifications
Style: Upright
Orientation: Top of deflector parallel to roof deck
Threads: 1/2" NPT or ISO 7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 175 psi (12 bar)
Sprinkler Temperature Rating: 212°F (100°C)
Sensitivity: Quick-response

Hydraulic Design Criteria
(See Table G and Figure 9 - 26)

Finish
Brass

Sprinkler Wrench
Model W2

Material Specifications
Thermal Sensor: Nickel Alloy Solder Link
Levers: Stainless Steel
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Button Clip: Stainless Steel
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Listings and Approvals
cULus Listed

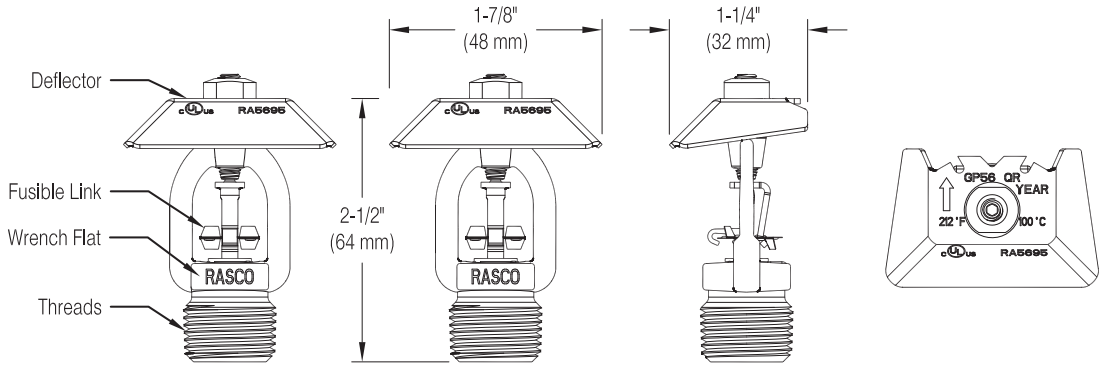
Hazard Classification
Light Hazard

System Types
Wet-pipe with steel or Listed CPVC pipe
Dry-pipe with steel pipe

Installation Criteria
Sprinkler Spacing
Minimum 6 ft (1.8 m), maximum 10 ft (3.0 m) between sprinklers across roof slope.
Minimum 6 ft (1.8 m) up roof slope to nearest sprinkler, minimum 10 ft (3.0 m) down slope to nearest sprinkler, measured parallel to roof deck.

Distance from Top of Deflector to Roof Deck (measured perpendicular to roof deck)
Min: 9 inches (230 mm)
Max: 13 inches (330 mm)

Model GP56 Sprinkler Components and Dimensions — Figure 6



Model GP56 Minimum Required Flow and Residual Pressure — Table G

Ceiling Slope	Max. Coverage Area[2] ft x ft (m x m)	Flow gpm (l/min)	Pressure psi (bar)
4:12 to 8:12[1]	10 x 15 (3.0 x 4.6)	17 (64)	9.2 (0.63)

Notes:
1. Use in the main attic area is limited to slopes not exceeding 8:12, however, the Model GP56 may be used to protect dormers, mansards, or similar single slope areas with slopes up to 12:12 where protection can be achieved with a single row of sprinklers.
2. Long dimension of coverage area to be along the roof slope parallel to trusses. Coverage is 3 ft. (0.9m) toward the peak and 12 ft. (3.7m) toward the eave from the sprinkler. Coverage area to be measured parallel to the floor.

Model AH42 Specific Application Sprinkler — SIN RA5623

Technical Specifications
Style: Upright
Orientation: Top of deflector parallel to roof deck
Threads: 1/2" NPT or ISO 7-1R1/2
Nominal K-Factor: 4.2 (60 metric)
Max. Working Pressure: 175 psi (12 bar)
Sprinkler Temperature Rating: 212°F (100°C)
Sensitivity: Quick-response

Hydraulic Design Criteria
(See Table H, and Figures 24-26)

Finish
Brass

Sprinkler Wrench
Model W2

Material Specifications
Thermal Sensor: Nickel Alloy Solder Link
Levers: Stainless Steel
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Button Clip: Stainless Steel
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: CHROME PLATED Bronze Alloy

Listings and Approvals
cULus Listed[1]

Hazard Classification
Light Hazard

System Types
Wet-pipe with steel or Listed CPVC pipe

Dry-pipe with steel pipe[2]

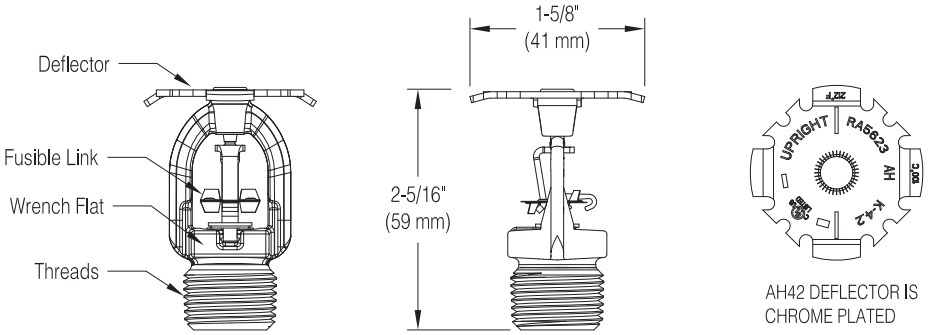
Installation Criteria
Sprinkler Spacing
Minimum 5 ft (1.5 m), maximum 10 ft (3.0 m) between sprinklers across roof slope.
Minimum 12 ft (3.7 m) down slope to nearest sprinkler, measured parallel to roof deck.
Note: A minimum 2 ft (0.61 m) lateral offset is required between AH sprinklers when viewed looking up the roof slope.

Distance from Top of Deflector to Bottom of Truss Top Chord (measured perpendicular to roof deck)
Min: 1 inches (25 mm)
Max: 3 inches (76 mm)

Frame Arm Orientation
Frame arms are to be oriented parallel to the eave at the bottom of the protected space.

Note:
1. Listed for the protection of sloped combustible and noncombustible concealed spaces, including hip roofs with traditionally framed or step down truss construction.
2. NFPA13 requires the use of corrosion resistant or internally galvanized steel piping when using sprinklers with a K-Factor of 4.2.

Model AH42 Sprinkler Components and Dimensions — Figure 7



Model AH42 Minimum Required Flow and Residual Pressure — Table H

Ceiling Slope	Max. Coverage Area[2][3] ft x ft (m x m)	Flow gpm (l/min)	Pressure psi (bar)
4:12 to 8:12[1]	10 x 15 (3.0 x 4.6)	15 (57)	12.8 (0.88)

Notes:
1. Use in the main attic area is limited to slopes not exceeding 8:12, however, the Model AH42 may be used to protect hips and dormers with slopes up to 12:12.
2. Long dimension of coverage area to be along the roof slope. Coverage is 6'-0" (1.8m) toward the peak and 9'-0" (2.7m) toward the eave from the sprinkler. Coverage area to be measured parallel to the floor.
3. The first row of AH sprinklers may be a maximum of 9'-0" from the eave; however, the first row must always be on the eave side of the girder truss (see Figures 24 and 25).

Model AH56 Specific Application Sprinkler — SIN RA5626

Technical Specifications
Style: Upright
Orientation: Top of deflector parallel to roof deck
Threads: 1/2" NPT or ISO 7-1R1/2
Nominal K-Factor: 5.6 (80 metric)
Max. Working Pressure: 175 psi (12 bar)
Sprinkler Temperature Rating: 212°F (100°C)
Sensitivity: Quick-response

Hydraulic Design Criteria
(See Table I, and Figures 24-26)

Finish
Brass

Sprinkler Wrench
Model W2

Material Specifications
Thermal Sensor: Nickel Alloy Solder Link
Levers: Stainless Steel
Sprinkler Frame: Brass Alloy
Button: Copper Alloy
Button Clip: Stainless Steel
Sealing Assembly: Nickel Alloy with PTFE
Load Screw: Bronze Alloy
Deflector: Bronze Alloy

Listings and Approvals
cULus Listed*

Hazard Classification
Light Hazard

System Types
Wet-pipe with steel or Listed CPVC pipe

Dry-pipe with steel pipe

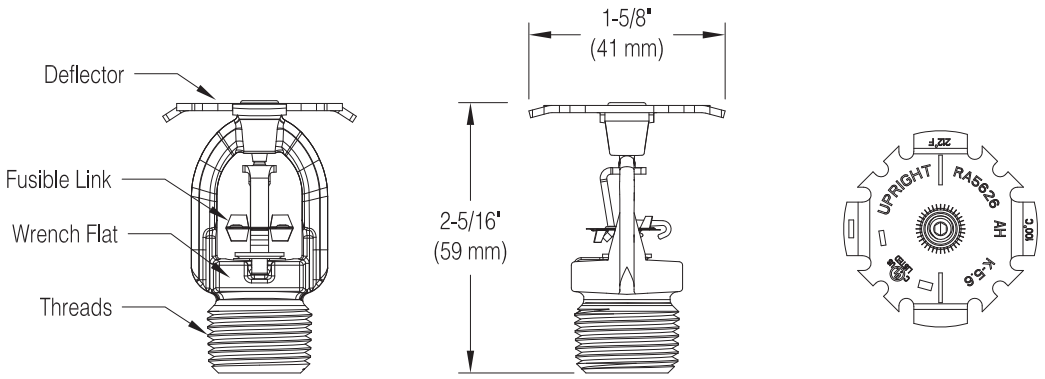
Installation Criteria
Sprinkler Spacing
Minimum 6 ft (1.8 m), maximum 10 ft (3.0 m) between sprinklers across roof slope.
Minimum 12 ft (3.7 m) down slope to nearest sprinkler, measured parallel to roof deck.
Note: A minimum 2 ft (0.61 m) lateral offset is required between AH sprinklers when viewed looking up the roof slope.

Distance from Top of Deflector to Bottom of Truss Top Chord (measured perpendicular to roof deck)
Min: 1 inches (25 mm)
Max: 3 inches (76 mm)

Frame Arm Orientation
Frame arms are to be oriented parallel to the eave at the bottom of the protected space.

***Note:** Listed for the protection of sloped combustible and noncombustible concealed spaces, including hip roofs with traditionally framed or step down truss construction.

Model AH56 Sprinkler Components and Dimensions — **Figure 8**

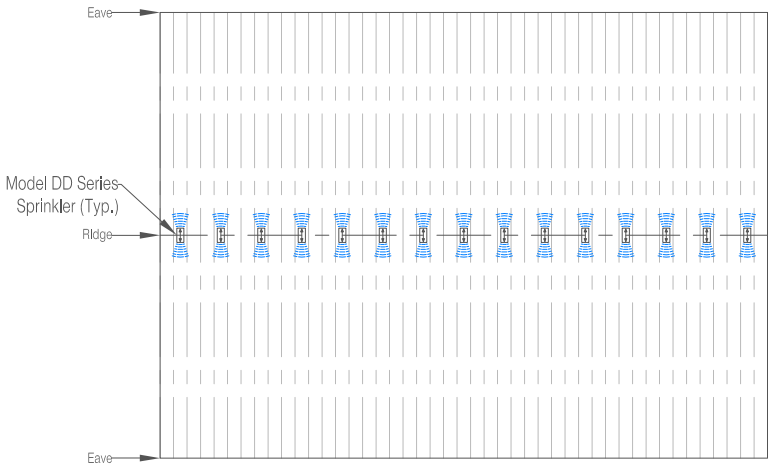


Model AH56 Minimum Required Flow and Residual Pressure — **Table I**

Ceiling Slope	Max. Coverage Area[2][3] ft x ft (m x m)	Flow gpm (l/min)	Pressure psi (bar)
4:12 to 8:12[1]	10 x 15 (3.0 x 4.6)	15 (57)	7.2 (0.50)

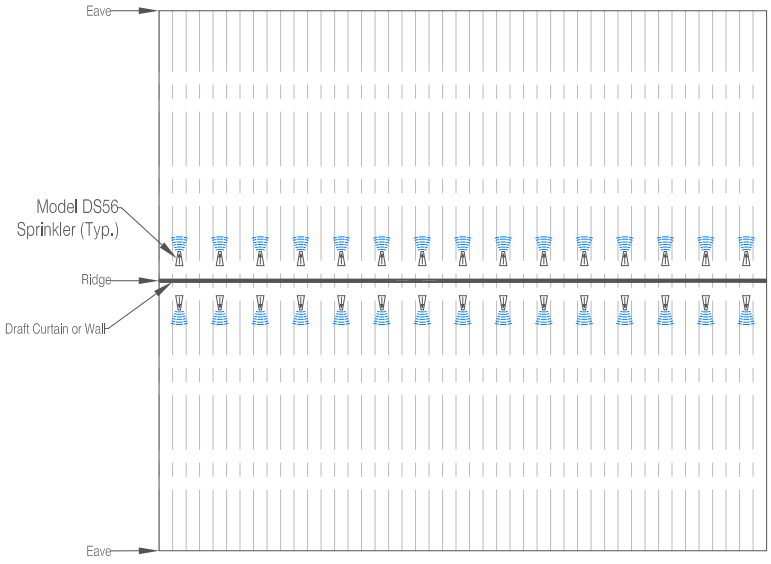
Notes:
1. Use in the main attic area is limited to slopes not exceeding 8:12, however, the Model AH56 may be used to protect hips and dormers with slopes up to 12:12.
2. Long dimension of coverage area to be along the roof slope. Coverage is 6'-0" (1.8m) toward the peak and 9'-0" (2.7m) toward the eave from the sprinkler. Coverage area to be measured parallel to the floor.
3. The first row of AH sprinklers may be a maximum of 9'-0" from the eave; however, the first row must always be on the eave side of the girder truss (see Figures 24 and 25).

Model DD Series Sprinkler – Example Layout (Not to Scale) **Figure 9**



Calculation Requirements:
Wet System-Most demanding five (5) DD Series Sprinklers
Dry System-Most demanding seven (7) DD Series Sprinklers

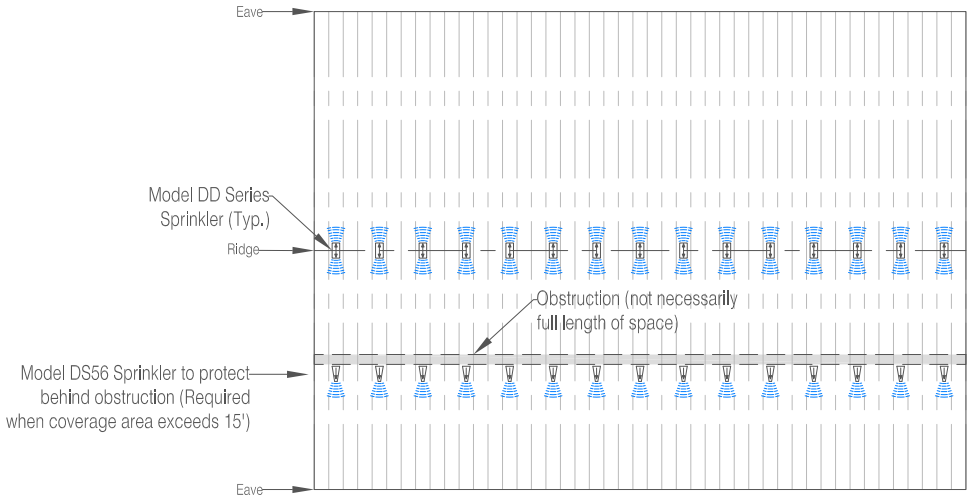
Model DS56 Sprinkler – Example Layout (Not to Scale) **Figure 10**



Calculation Requirements:
- Wet System-Most demanding five (5) DS56 Sprinklers
- Dry System-Most demanding nine (9) DS56 Sprinklers

Model DD Series Sprinklers at Ridge with Model DS56 Sprinklers Beyond Obstruction Example Layout (Not to Scale)

Figure 11

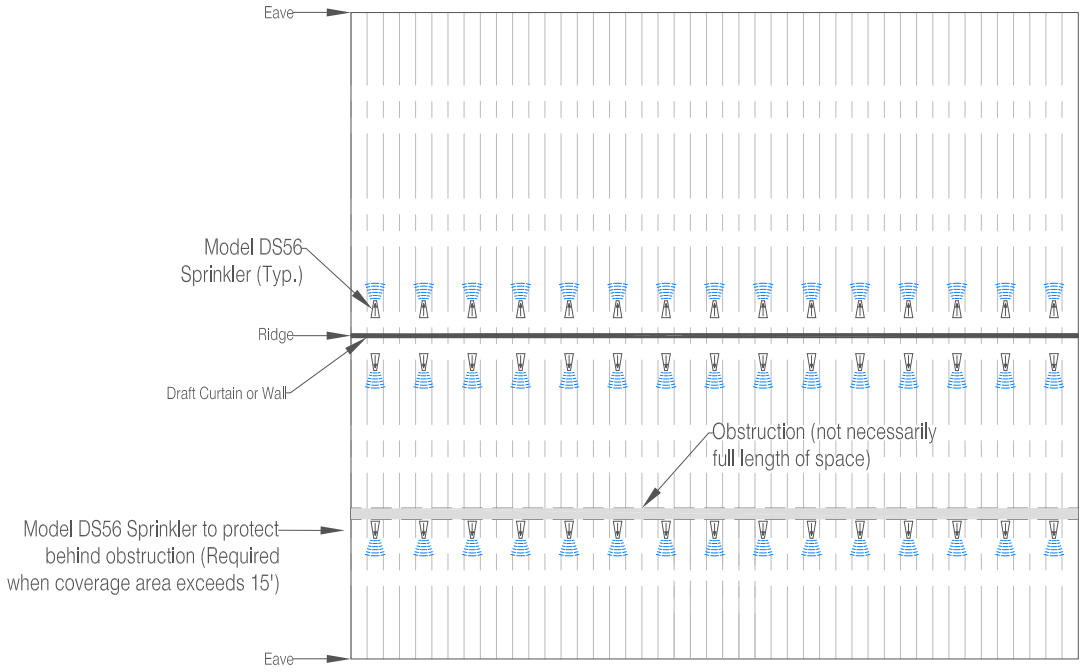


Calculation Requirements:

- Wet System-Most demanding five (5) DD Series Sprinklers and two (2) DS56 Sprinklers
- Dry System-Most demanding seven (7) DD Series Sprinklers and two (2) DS56 Sprinklers

Model DS56 Sprinklers at Ridge with Model DS56 Sprinklers Beyond Obstruction Example Layout (Not to Scale)

Figure 12

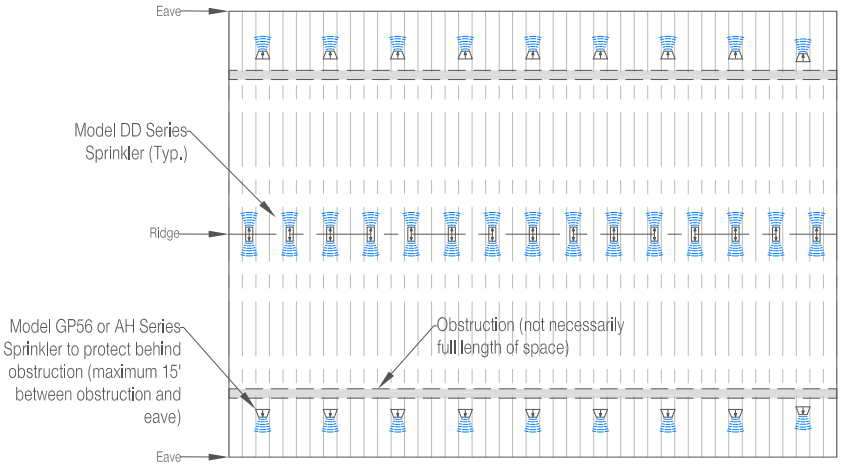


Calculation Requirements:

- Wet System-Most demanding five (5) DD Series Sprinklers and two (2) DS56 Sprinklers
- Dry System-Most demanding seven (7) DD Series Sprinklers and two (2) DS56 Sprinklers

Model DD Series Sprinklers at Ridge with Model GP56 or AH Series Sprinklers Beyond Obstruction Example Layout (Not to Scale)

Figure 13

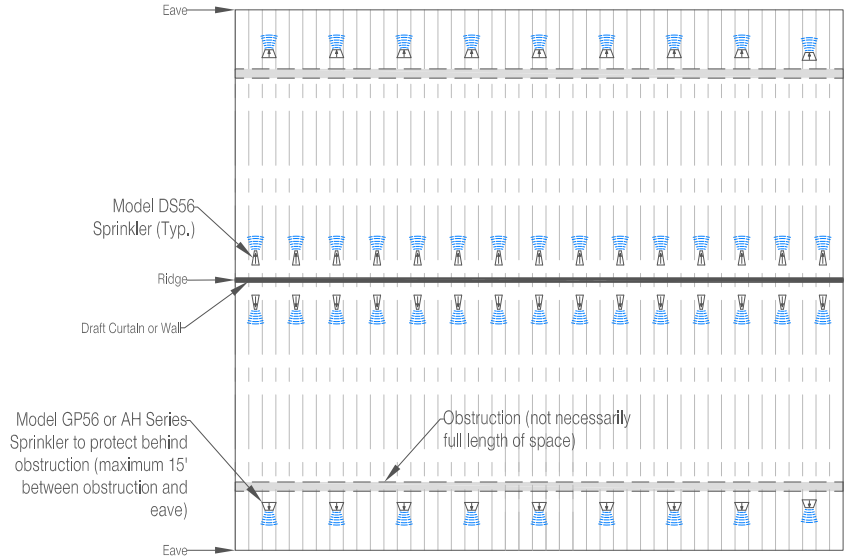


Calculation Requirements:

- Wet System-Most demanding five (5) DD Series Sprinklers and two (2) GP56 or AH Series Sprinklers
- Dry System-Most demanding seven (7) DD Series Sprinklers and two (2) GP56 or AH Series Sprinklers

Model DS56 Sprinklers at Ridge with Model GP56 or AH Series Sprinklers Beyond Obstruction Example Layout (Not to Scale)

Figure 14

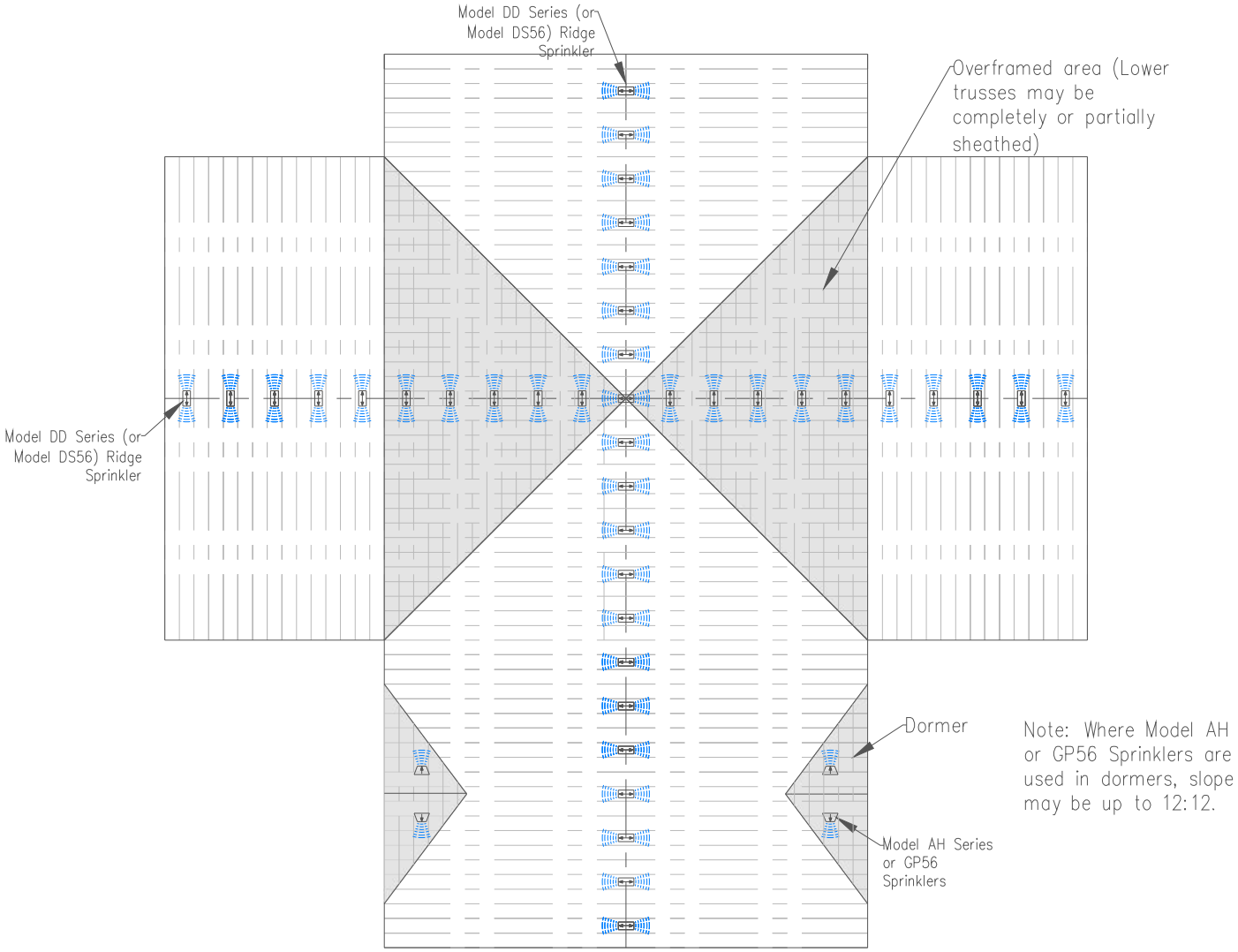


Calculation Requirements:

- Wet System-Most demanding five (5) DS56 Sprinklers and two (2) GP56 or AH Series Sprinklers
- Dry System-Most demanding seven (7) DS56 Sprinklers and two (2) GP56 or AH Series Sprinklers

Model DD Series Sprinklers at Ridge with Model GP56 or AH Series Sprinklers in Dormers Example Layout (Not to Scale)

Figure 15



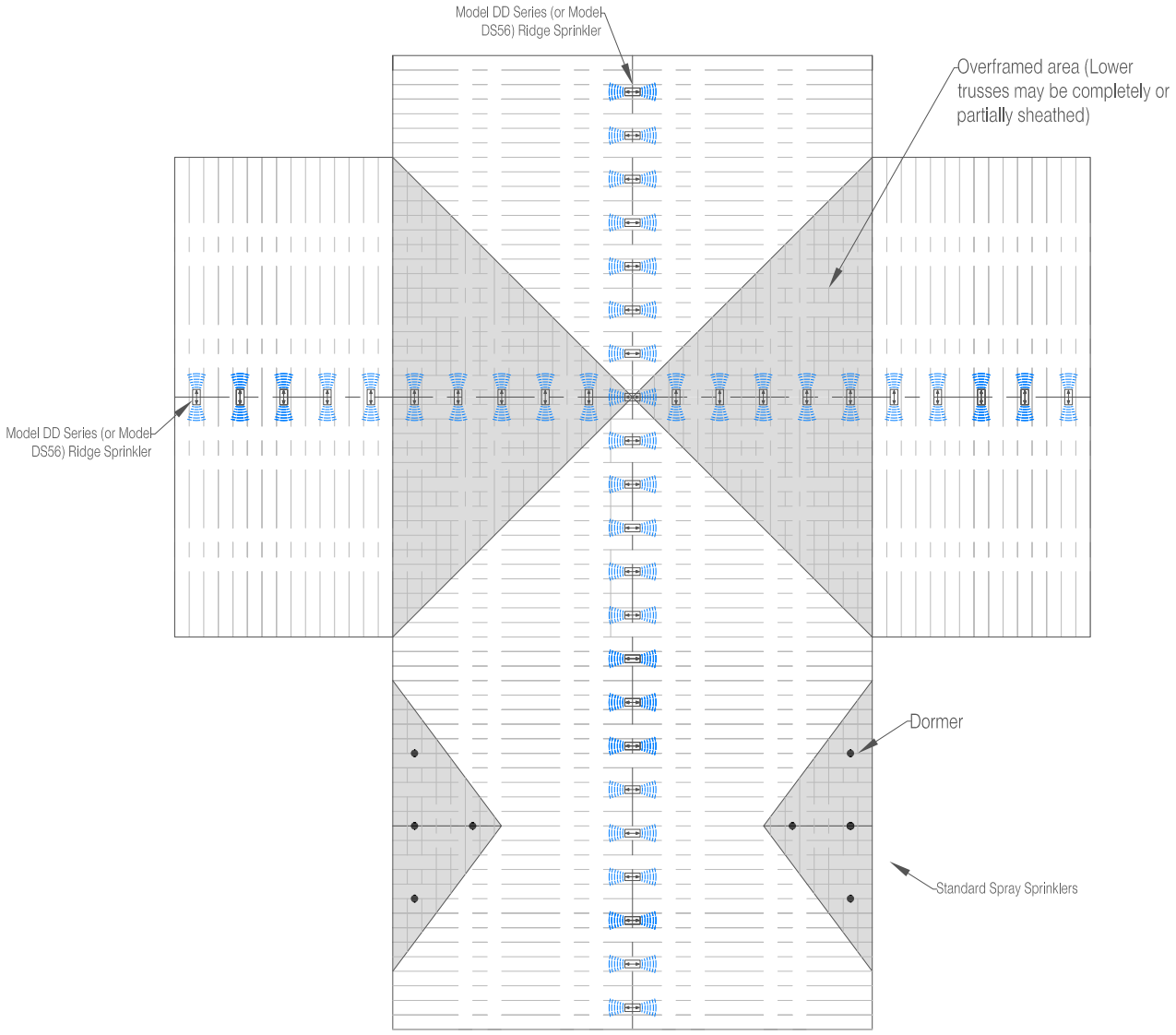
Calculation Requirements Where Attic and Dormer Spaces are NOT Separated*:

- Wet System-Most demanding five (5) ridge sprinklers and two (2) AH Series or Model GP56 sprinklers when there are four (4) sprinklers or less in dormer. When more than four (4) AH Series or GP56 sprinklers in dormer, separately calculate (a) five (5) ridge sprinklers and (b) all AH Series or Model GP56 sprinklers in dormer (up to a maximum 1500 ft^2 area) and use the greater of the two demands.
- Dry System-Most demanding seven (7) ridge sprinklers and two (2) AH Series or GP56 sprinklers when there are four (4) sprinklers or less in dormer. When more than four (4) AH Series or Model GP56 sprinklers in dormer separately calculate (a) seven (7) ridge sprinklers and (b) all AH Series or Model GP56 sprinklers in dormer (up to a maximum 1950 square foot area), and use the greater of the two demands.

***Note**: Where attic and dormer spaces are separate, compartmentalized areas, the combined ridge sprinkler and dormer sprinkler calculation is not required.

Model DD Series Sprinklers at Ridge with Standard Spray Sprinklers at Dormer or Cross Example Layout (Not to Scale)

Figure 16



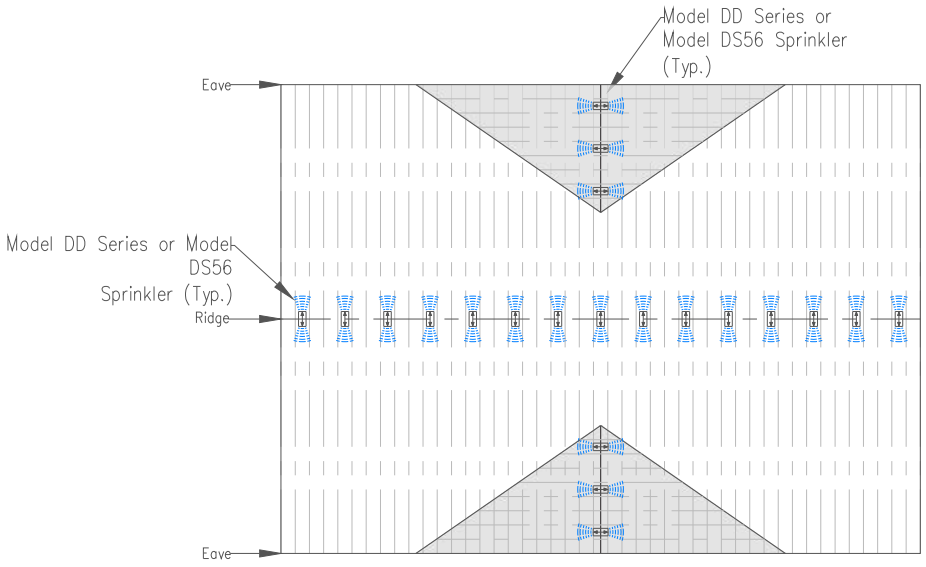
Calculation Requirements When Attic and Dormer Spaces are NOT Separated*:

- Wet System-Most demanding five (5) ridge sprinklers and two (2) standard spray sprinklers when there are four (4) sprinklers or less in dormer. When more than four (4) sprinklers in dormer, separately calculate the most demanding remote area, including all sprinkler types, per NFPA 13, and use the greater of the two demands. 30% remote area increase for sloped ceiling is required, and remote area reduction for use of quick response standard spray sprinklers may be applicable.
- Dry System-Most demanding seven (7) ridge sprinklers and two (2) standard spray sprinklers when there are four (4) sprinklers or less in dormer. When more than four (4) sprinklers in dormer, separately calculate the most demanding remote area, including all sprinkler types, per NFPA 13, and use the greater of the two demands. 30% remote area increase for sloped ceiling and 30% remote area increase for dry system is required.

***Note:** Where spaces are separate, compartmentalized areas, calculate the ridge sprinklers per figures 9 or 10, and the dormers per NFPA 13, and use the greater of the two demands.

Model DD Series Sprinklers at Ridge with Model DD Series Sprinklers in Dormers Example Layout (Not to Scale)

Figure 17



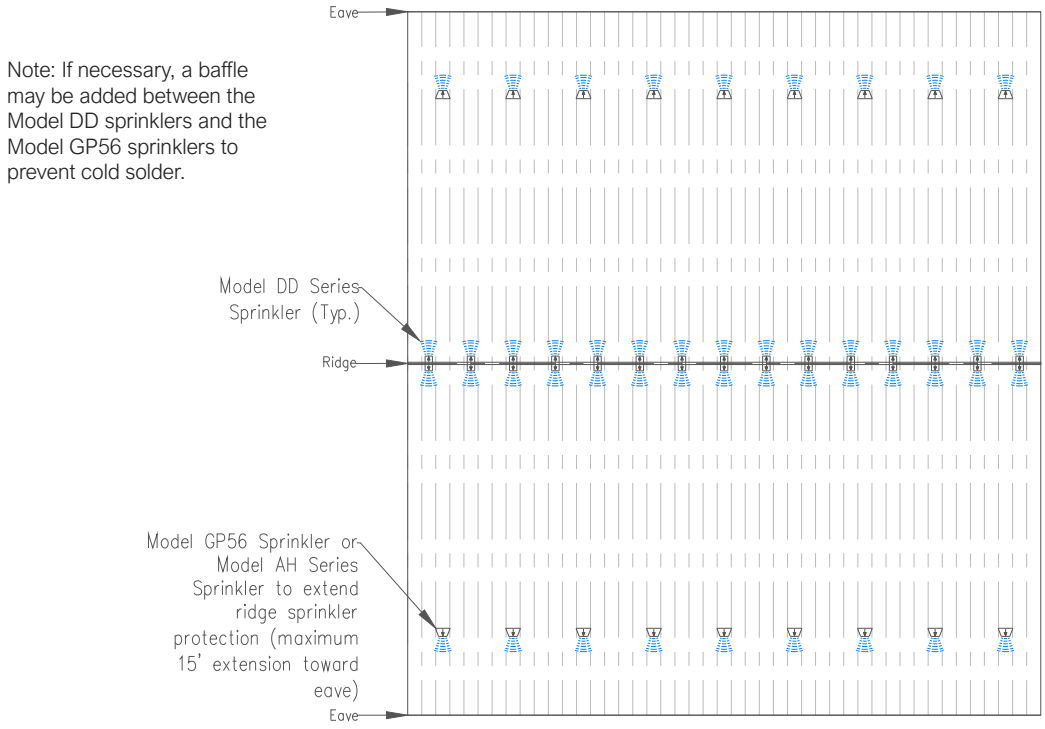
Calculation Requirements Where Attic and Dormer Spaces are NOT Separated*:

- Wet System-Most demanding five (5) Model DD Series or DS56 sprinklers at ridge plus up to two (2) sprinklers in dormer
- Dry System-Most demanding seven (7) Model DD Series or DS56 sprinklers at ridge plus up to two (2) sprinklers in dormer

***Note:** Where attic and dormer spaces are separate, compartmentalized areas, refer to Figures 9 or 10.

Model DD Series Sprinklers at Ridge with Model GP56 or AH Series Sprinklers at Eave Example Layout (Not to Scale)

Figure 18



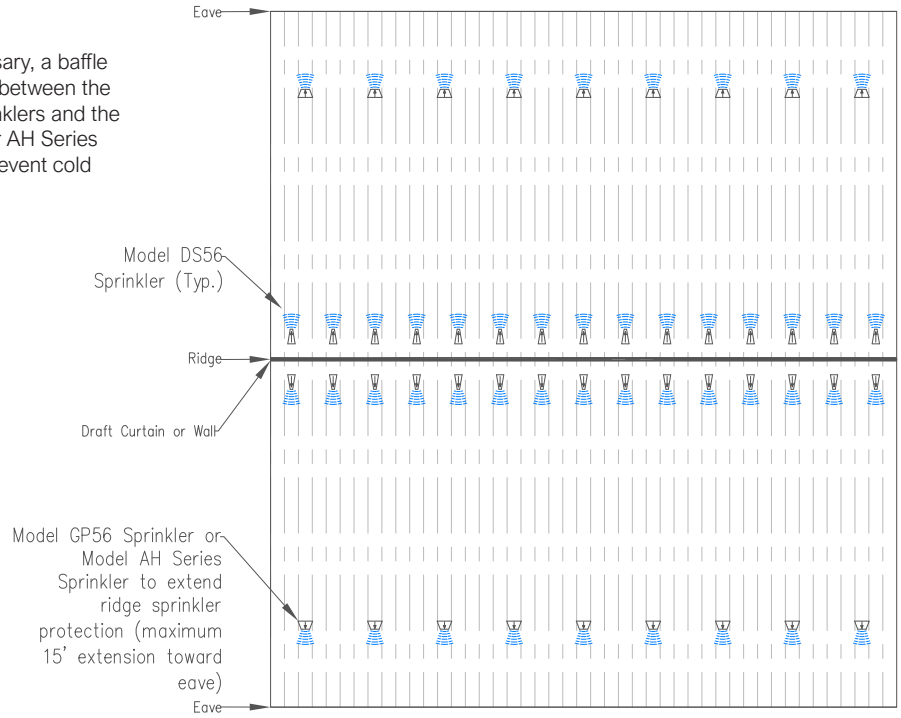
Calculation Requirements:

- Wet System-Most demanding five (5) DD Series Sprinklers and two (2) GP56 or AH Series Sprinklers
- Dry System-Most demanding seven (7) DD Series Sprinklers and two (2) GP56 or AH Series Sprinklers

Model DS56 Sprinklers at Ridge with Model GP56 or AH Series Sprinklers at Eave
Example Layout (Not to Scale)

Figure 19

Note: If necessary, a baffle may be added between the Model DS sprinklers and the Model GP56 or AH Series sprinklers to prevent cold solder.

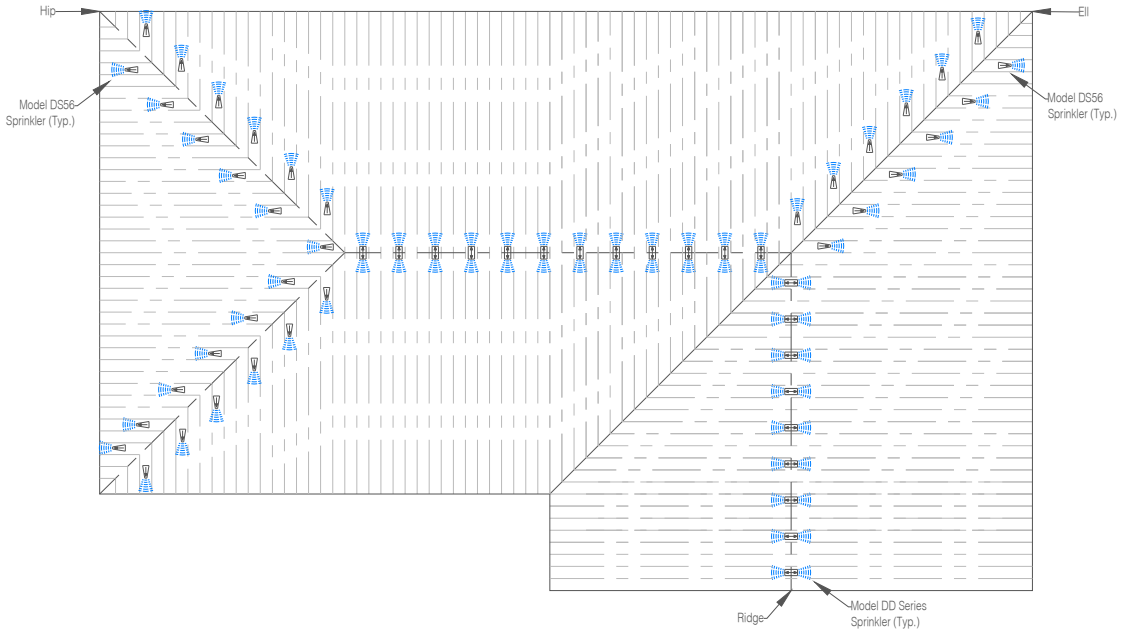


Calculation Requirements:

- Wet System-Most demanding five (5) DS56 Sprinklers and two (2) GP56 or AH Series Sprinklers
- Dry System-Most demanding seven (7) DS56 Sprinklers and two (2) GP56 or AH Series Sprinklers

Model DD Series Sprinklers at Ridge with DS56 Sprinklers at Hip or Ell
Example Layout (Not to Scale)

Figure 20

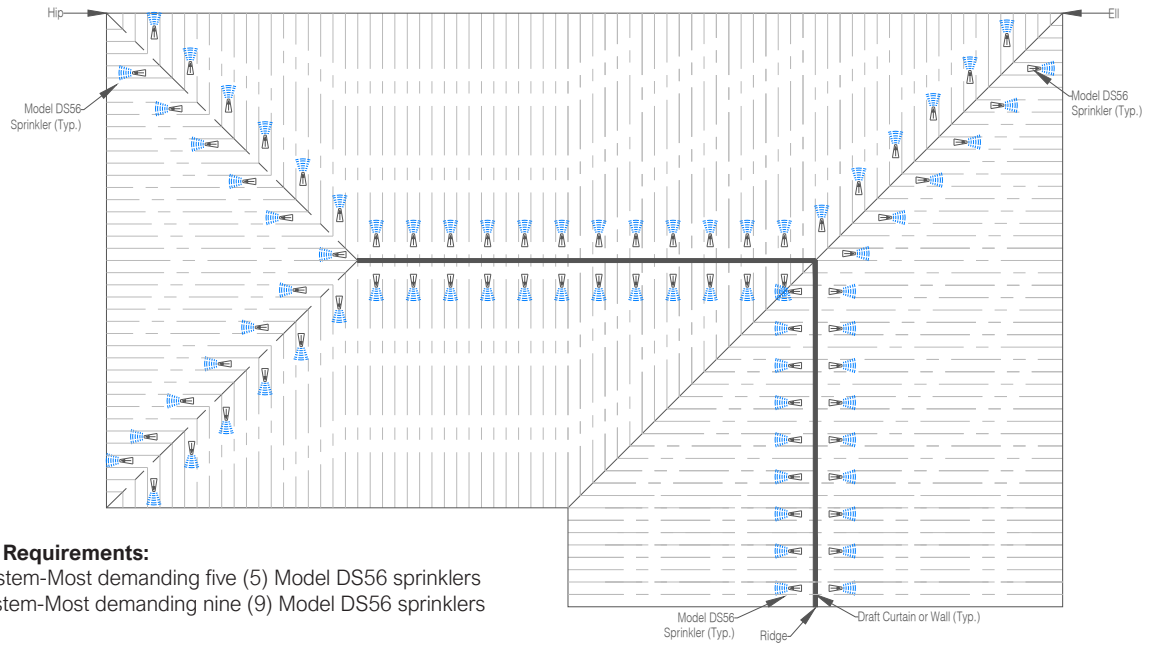


Calculation Requirements:

- Wet System-Most demanding five (5) Model DD Series and/or DS56 sprinklers
- Dry System-Most demanding nine (9) Model DD Series and/or DS56 sprinklers; of which only a maximum of seven (7) must be Model DD Series (ridge) sprinklers

Model DS56 Sprinklers at Ridge with DS56 Sprinklers at Hip or Ell
Example Layout (Not to Scale)

Figure 21

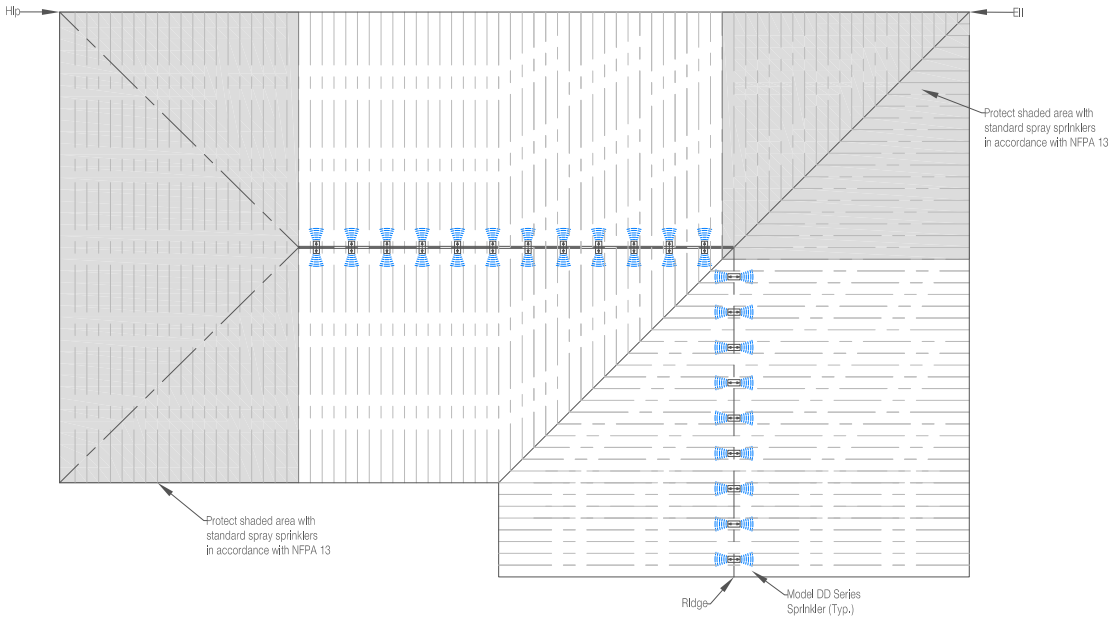


Calculation Requirements:

- Wet System-Most demanding five (5) Model DS56 sprinklers
- Dry System-Most demanding nine (9) Model DS56 sprinklers

Model DD Series Sprinklers at Ridge with Standard Spray Sprinklers at Hip or Ell
Example Layout (Not to Scale)

Figure 22



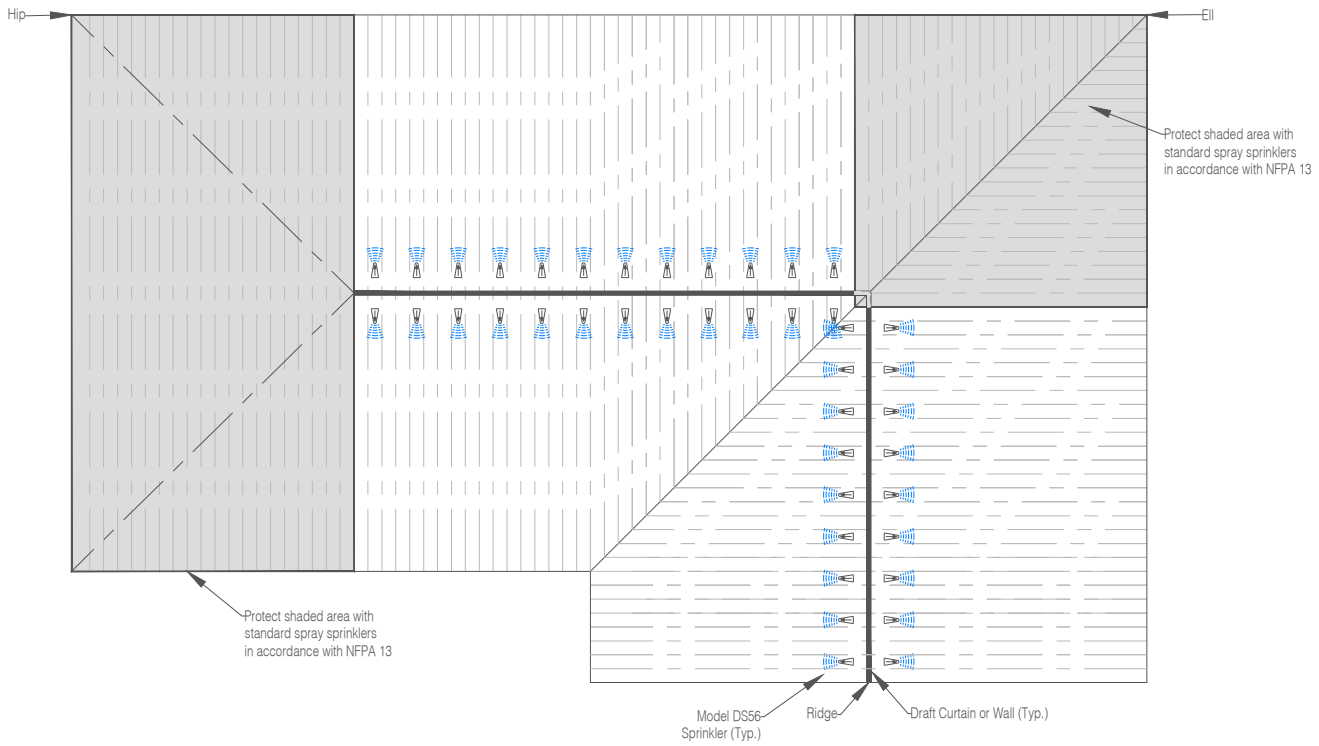
Calculation Requirements When Attic and Hip or Ell Spaces are NOT Separated*:

- Wet System-Most demanding five (5) ridge sprinklers and two (2) standard spray sprinklers when there are four (4) sprinklers or less in the hip or ell. When more than four (4) sprinklers in hip or ell, separately calculate the most demanding remote area, including all sprinkler types, per NFPA 13, and use the greater of the two demands. 30% remote area increase for sloped ceiling is required, and remote area reduction for use of quick response standard spray sprinklers may be applicable.
- Dry System-Most demanding seven (7) ridge sprinklers and two (2) standard spray sprinklers when there are four (4) sprinklers or less in hip or ell. When more than four (4) sprinklers in hip or ell, separately calculate the most demanding remote area, including all sprinkler types, per NFPA 13, and use the greater of the two demands. 30% remote area increase for sloped ceiling and 30% remote area increase for dry system is required.

***Note:** Where spaces are separate, compartmentalized areas, calculate the ridge sprinklers per figure 9, and the hip or ell area per NFPA 13, and use the greater of the two demands.

Model DS56 Sprinklers at Ridge with Standard Spray Sprinklers at Hip or Ell Example Layout (Not to Scale)

Figure 23



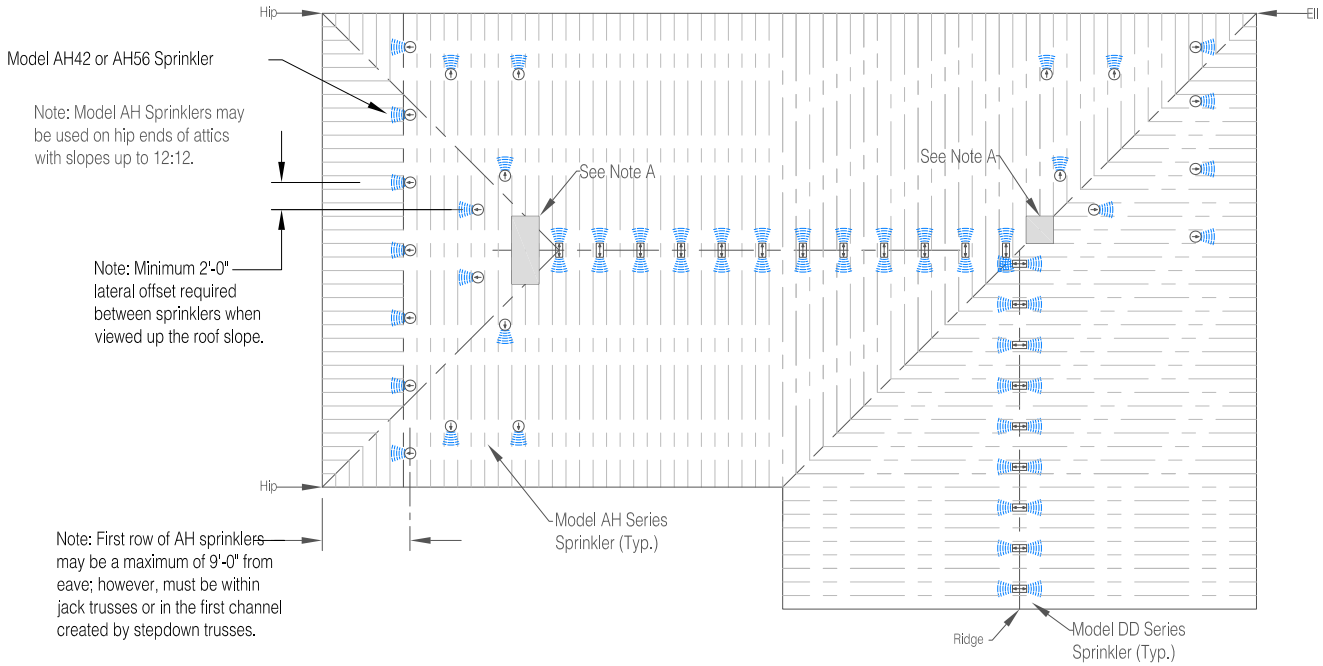
Calculation Requirements When Attic and Hip or Ell Spaces are NOT Separated*:

- Wet System-Most demanding five (5) ridge sprinklers and two (2) standard spray sprinklers when there are four (4) sprinklers or less in the hip or ell. When more than four (4) sprinklers in hip or ell, separately calculate the most demanding remote area, including all sprinkler types, per NFPA 13, and use the greater of the two demands. 30% remote area increase for sloped ceiling is required, and remote area reduction for use of quick response standard spray sprinklers may be applicable.
- Dry System-Most demanding seven (7) ridge sprinklers and two (2) standard spray sprinklers when there are four (4) sprinklers or less in hip or ell. When more than four (4) sprinklers in hip or ell, separately calculate the most demanding remote area, including all sprinkler types, per NFPA 13, and use the greater of the two demands. 30% remote area increase for sloped ceiling and 30% remote area increase for dry system is required.

***Note:** Where spaces are separate, compartmentalized areas, calculate the ridge sprinklers per figure 10, and the hip or ell area per NFPA 13, and use the greater of the two demands.

Model DD Series Sprinklers at Ridge and Model AH Sprinklers at Hip and Ell
Example Layout (Not to Scale)

Figure 24



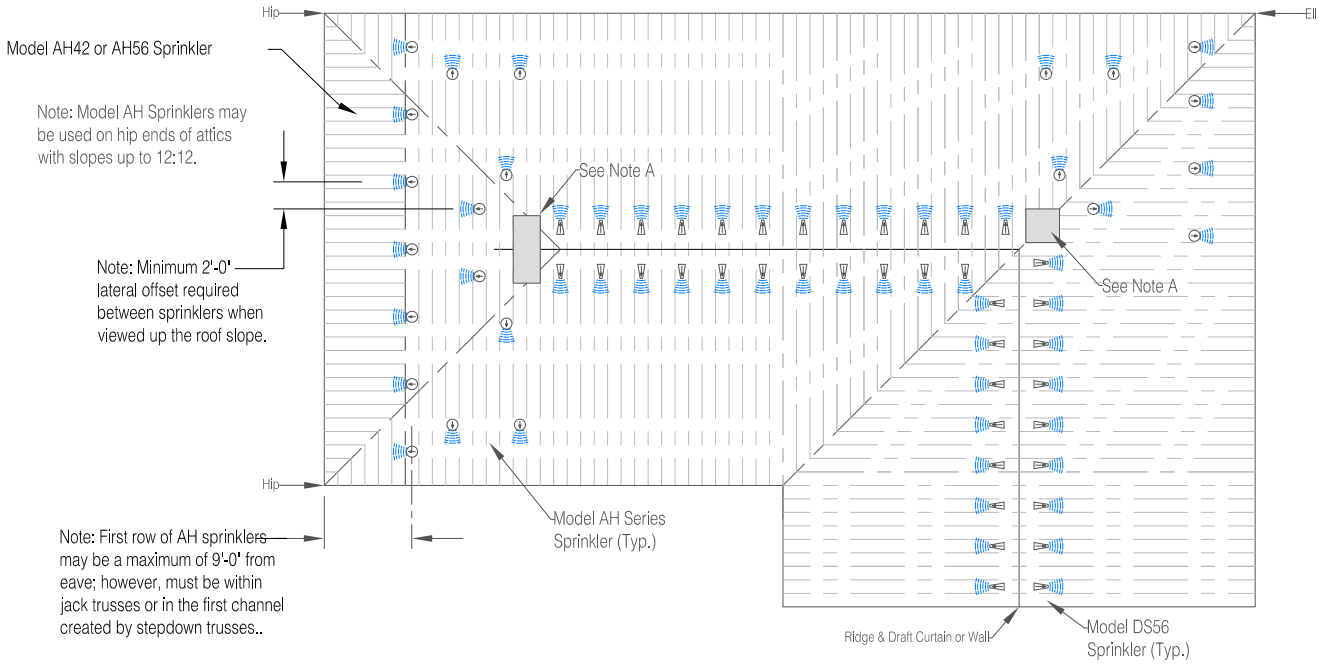
Calculation Requirements:

- Wet System-Most demanding five (5) Model DD Series ridge sprinklers and two (2) AH sprinklers when there are four (4) AH sprinklers or less. When more than four (4) AH sprinklers, separately calculate (a) five (5) Model DD Series ridge sprinklers and two (2) AH sprinklers, and (b) all AH sprinklers (up to a maximum 1500 square foot area) and use the greater of the two demands.
- Dry System-Most demanding seven (7) Model DD Series ridge sprinklers and two (2) AH sprinklers when there are four (4) AH sprinklers or less. When more than four (4) AH sprinklers, separately calculate (a) seven (7) Model DD Series ridge sprinklers and two (2) AH sprinklers, and (b) all AH sprinklers (up to a maximum 1950 square foot area) and use the greater of the two demands.

Note A: A single quick-response standard spray upright sprinkler installed in accordance with NFPA 13 may be used for the protection of small areas outside the coverage areas of the specific application attic sprinklers. Demand for the single sprinkler shall be added to the calculations listed above if it falls within the 1500 ft^2 wet system or 1950 ft^2 dry system design area. CPVC piping on wet pipe systems is permitted for supplying individual quick-response standard spray upright sprinklers installed in this manner.

Model DS56 Sprinklers at Ridge and Model AH Sprinklers at Hip and Ell
Example Layout (Not to Scale)

Figure 25

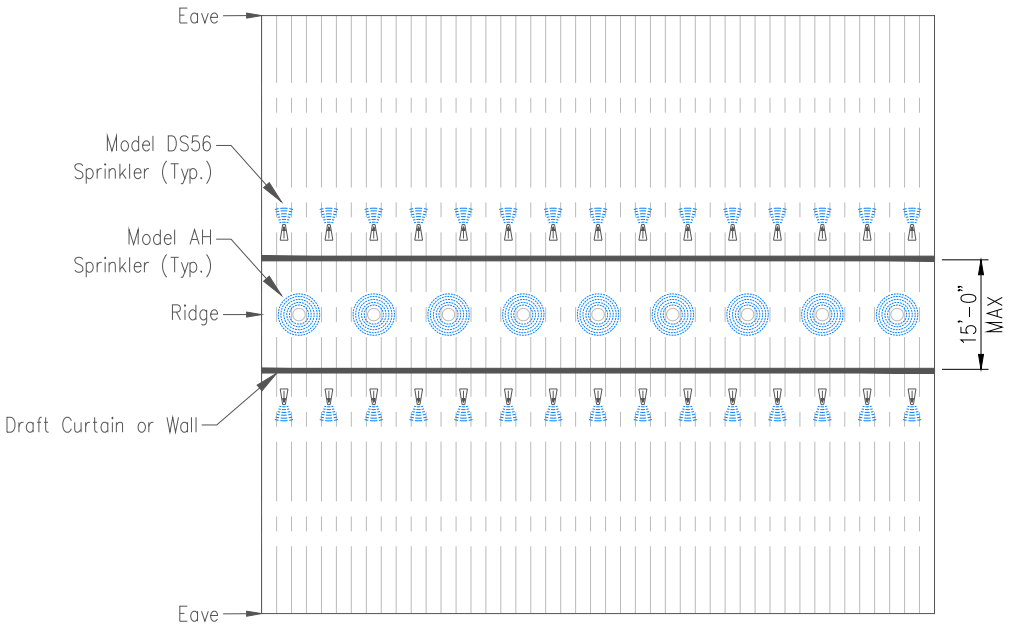


Calculation Requirements:

- Wet System-Most demanding five (5) Model DS-56 Series ridge sprinklers and two (2) AH sprinklers when there are four (4) AH sprinklers or less. When more than four (4) AH sprinklers, separately calculate (a) five (5) Model DS-56 Series ridge sprinklers and two (2) AH sprinklers, and (b) all AH sprinklers (up to a maximum 1500 square foot area) and use the greater of the two demands.
- Dry System-Most demanding seven (7) Model DS-56 Series ridge sprinklers and two (2) AH sprinklers when there are four (4) AH sprinklers or less. When more than four (4) AH sprinklers, separately calculate (a) seven (7) Model DS-56 Series ridge sprinklers and two (2) AH sprinklers, and (b) all AH sprinklers (up to a maximum 1950 square foot area) and use the greater of the two demands.

Note A: A single quick-response standard spray upright sprinkler installed in accordance with NFPA 13 may be used for the protection of small areas outside the coverage areas of the specific application attic sprinklers. Demand for the single sprinkler shall be added to the calculations listed above if it falls within the 1500 sf wet system or 1950 sf dry system design area. CPVC piping on wet pipe systems is permitted for supplying individual quick-response standard spray upright sprinklers installed in this manner.

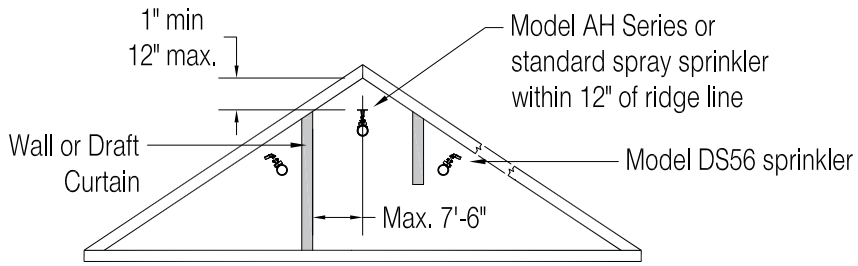
Model AH Series Sprinklers at Ridge and DS56 Sprinklers in Attic (Plan View) **Figure 26**



Calculation Requirements:

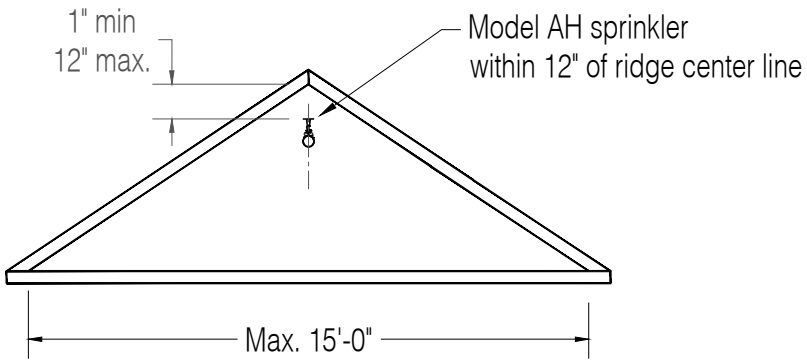
- Wet System-Most demanding five (5) sprinklers of either type
- Dry System-Most demanding nine (9) DS56 Sprinklers or (7) AH Series Sprinklers

Model AH Series Sprinklers at Ridge and DS56 Sprinklers in Attic (Cross Section) **Figure 26A**



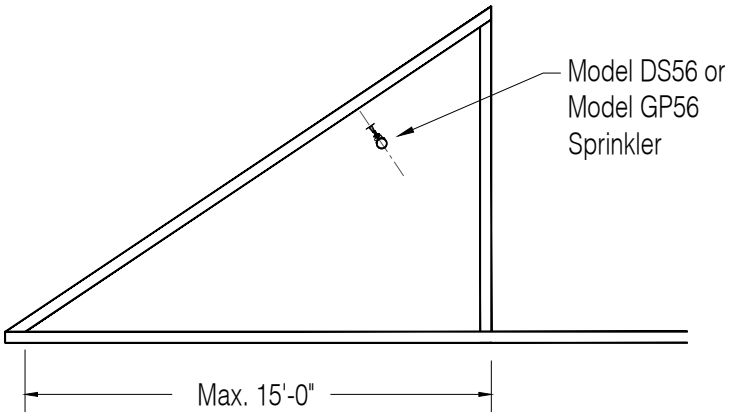
- Model AH Series Sprinklers used in this arrangement shall have the deflector oriented flat (parallel to the floor), and the frame arms parallel to the ridge line (i.e., frame window opening toward eaves).
- Coverage area, flow and pressure requirements, and obstruction rules for AH Series sprinklers to be in accordance with pages 8 and 9 of this bulletin.
- Reference NFPA 13 when using standard spray sprinklers at peak.

Model AH Sprinklers in Dormers (Cross Section) **Figure 26B**



- Model AH Sprinklers may be used in dormers having slopes of up to 12:12.
- Model AH Series Sprinklers used in this arrangement shall have the deflector oriented flat (parallel to the floor), and the frame arms parallel to the ridge line (i.e., frame window opening toward eaves).
- Coverage area, flow and pressure requirements, and obstruction rules for AH Series sprinklers to be in accordance with pages 8 and 9 of this bulletin.

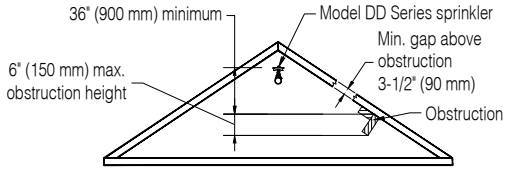
Model DS56 or Model GP56 Sprinklers in Mansards (Cross Section) **Figure 26C**



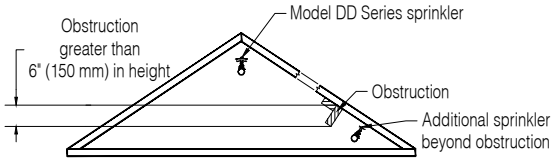
- Model DS56 and Model GP56 Sprinklers may be used in mansards or other similar single slope areas having slopes of up to 12:12.
- Model DS56 and Model GP56 sprinklers used in this arrangement shall be installed in accordance with Figures 29 and 30.
- Coverage area, flow and pressure requirements, and obstruction rules for sprinklers to be in accordance with pages 6 through 9 of this bulletin.

Obstruction Criteria

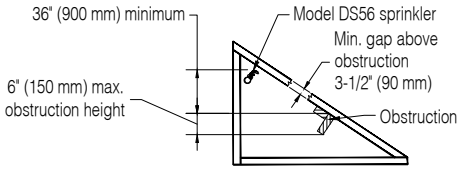
Figure 27



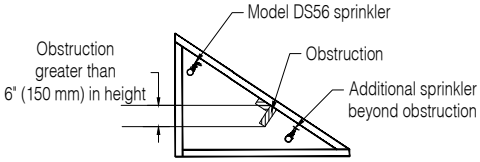
Additional sprinklers not required due to obstruction 6" (150 mm) or less in height with a minimum 3-1/2" (90 mm) gap provided between the top of the obstruction and the roof deck.



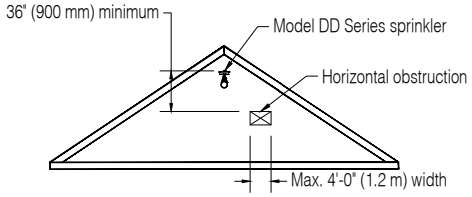
Additional sprinklers required beyond obstruction greater than 6" (150 mm) in height or where a minimum 3-1/2" (90 mm) gap is not provided between the top of the obstruction and the roof deck.



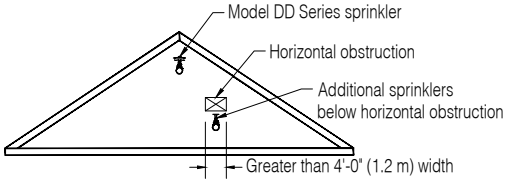
Additional sprinklers not required due to obstruction 6" (150 mm) or less in height with a minimum 3-1/2" (90 mm) gap provided between the top of the obstruction and the roof deck.



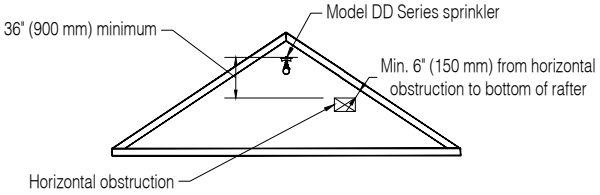
Additional sprinklers required beyond obstruction greater than 6" (150 mm) in height or where a minimum 3-1/2" (90 mm) gap is not provided between the top of the obstruction and the roof deck.



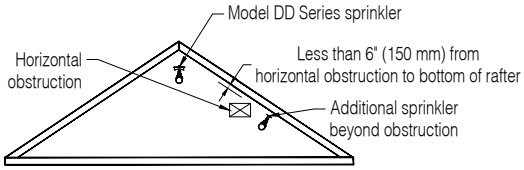
Additional sprinklers not required below horizontal obstruction 4'-0" (1.2 m) or less in width.



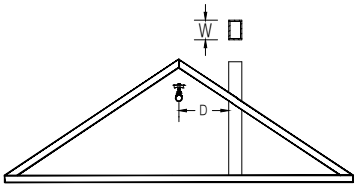
Additional sprinklers required below horizontal obstruction greater than 4'-0" (1.2 m) in width.



Additional sprinklers not required beyond horizontal obstruction more than 6" (150 mm) from bottom of rafter.



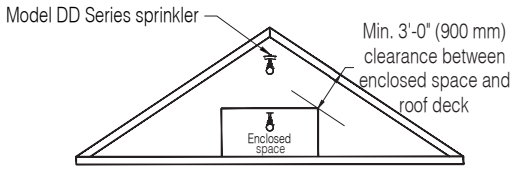
Additional sprinklers required beyond horizontal obstruction less than 6" (150 mm from bottom of rafter.



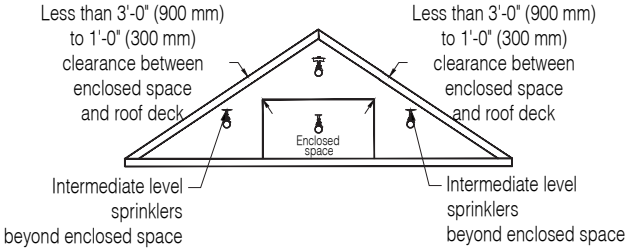
Additional sprinklers not required beyond vertical obstruction (see figure at left) where:

Obstruction width W is:	And minimum distance between sprinkler and obstruction D is:
1" or less (25 mm or less)	6" (150 mm)
1" to 4" (25 to 100 mm)	1'-0" (300 mm)
4" to 8" (100 to 200 mm)	2'-0 (600 mm)
8" to 10" (200 to 250 mm)	5'-0" (1.5 m)
10" to 20" (250 to 500 mm)	10'-0" (3.0 m)
20" to 30" (500 to 750 mm)	15'-0" (4.5 m)
30" to 40" (750 mm to 1000 mm)	20'-0" (6.0 m)
40" to 48" (1000 mm to 1200 mm)	25'-0" (7.5 m)

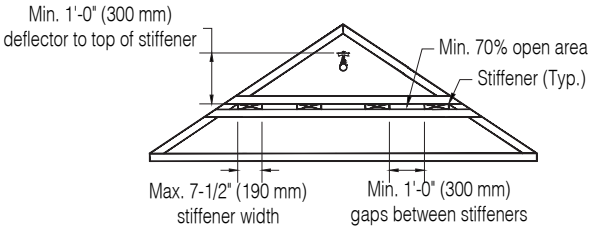
Provide sprinklers beyond vertical obstructions not meeting the criteria above.



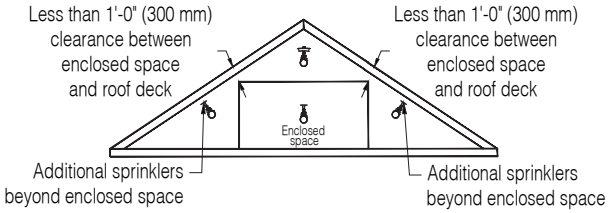
Additional sprinklers not required beyond enclosed space more than 3'-0" (900 mm from roof deck.



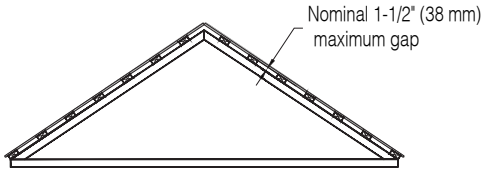
Additional intermediate level sprinklers required beyond enclosed space less than 3'-0" (900 mm) to 1'-0" (300 mm) from roof deck.



Additional sprinklers not required below stiffeners meeting all of the following criteria: (1) minimum 1'-0" (300 mm) below Reliable Attic sprinklers, (2) maximum 7-1/2" (190 mm) wide stiffeners, (3) minimum 1'-0" (300 mm) gaps between stiffeners, and (4) minimum 70% open area.

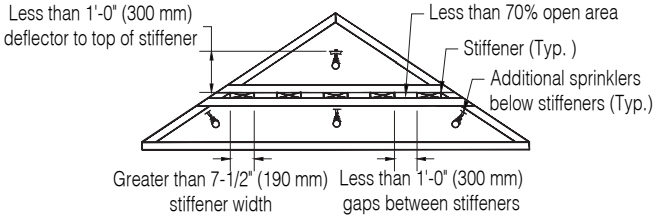


Additional sprinklers required beyond enclosed space less 1'-0" (300 mm) from roof deck.



Alternate Allowable Framing Method

A maximum 1-1/2 in (38 mm) gap between sheathing and top of structural framing members (such as that formed by nailers laid flat) is acceptable.



Additional sprinklers required below stiffeners: (1) less than 1'-0" (300 mm) below Reliable Attic sprinklers, (2) more than 7-1/2" (190 mm) wide stiffeners, (3) gaps between stiffeners are less than 1'-0" (300 mm), or (4) where the area of the horizontal plane where the stiffeners are located is less than 70% open.

Notes:

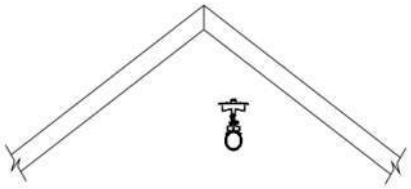
1. Attic sprinklers may be installed directly on pipe up to 2-1/2" NPS. For 3" NPS and larger pipe, the obstruction rules for Extended Coverage Upright Spray Sprinklers shall be followed.
2. Where specific obstruction criteria is not shown in Figures 27 and 28, the obstruction rules for Extended Coverage Upright Spray Sprinklers shall be followed.

Installation

Install Reliable Attic Sprinklers only in the orientation indicated in Figure 28. Figure 29 provides additional select installation criteria for each sprinkler model.

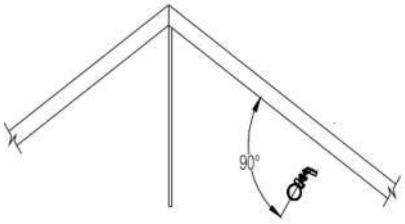
Installation Orientation **Figure 29**

Model DD Series



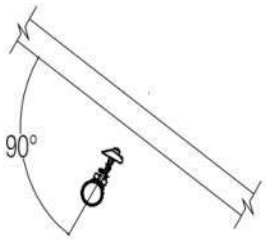
Install Model DD Series sprinklers with the **deflector parallel to the floor** and arrows on deflector pointing down the roof slope in both directions.

Model DS56



Install Model DS56 sprinklers with the **frame arms perpendicular to the roof deck (parallel with lower eave)** and the arrow on the deflector pointing down the roof slope.

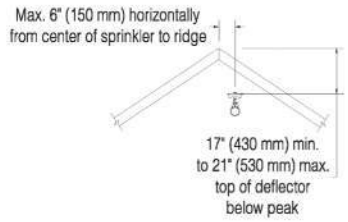
Model GP56 and AH Series



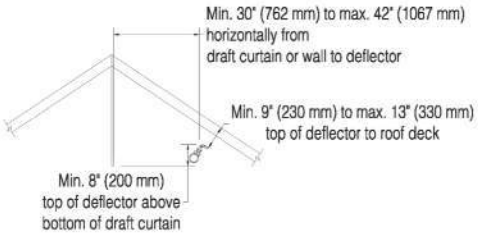
Install Model GP56 sprinklers with the **deflector parallel to the roof deck** and the arrow on the deflector pointing down the roof slope. Install Model AH Series sprinklers with the deflector parallel to the roof, and **frame arms parallel with the lower eave of the protected space.**

Installation Dimensions **Figure 30**

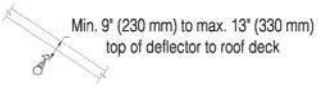
Model DD Series



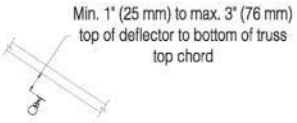
Model DS56



Model GP56

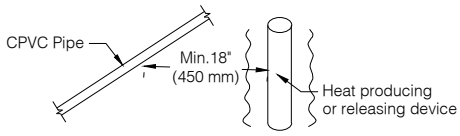


Model AH42 & AH56

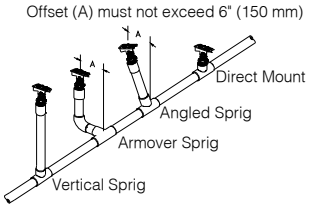


Note: Where Reliable Attic Sprinklers are installed on wet-pipe sprinkler systems with CPVC pipe, the CPVC pipe must be protected in accordance with the pipe manufacturer's installation instruction as well as the requirements in Figure 31 & 32.

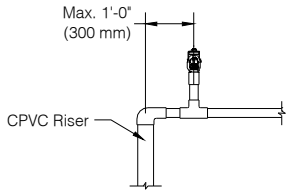
Installation Requirements for Use of Reliable Attic Sprinklers with Listed CPVC Pipe **Figure 31**



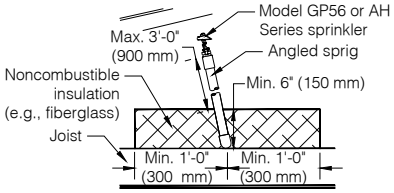
Maintain at least 18" (450 mm) between CPVC pipe and heat producing or releasing devices.



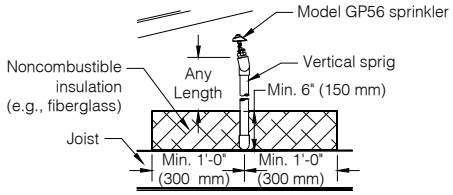
Install sprinklers on CPVC pipe only in the following configurations: (1) directly mounted to a fitting on the branch line pipe, (2) on an angled sprig where the horizontal distance between the sprinkler and the branch line does not exceed 6" (150 mm), (3) on an armover sprig where the horizontal distance between the sprinkler and the branch line does not exceed 6" (150 mm), or (4) on a vertical sprig.



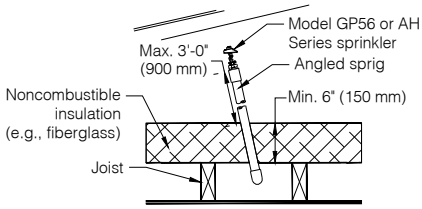
Locate a sprinkler within 1'-0" (300 mm) horizontally of CPVC risers



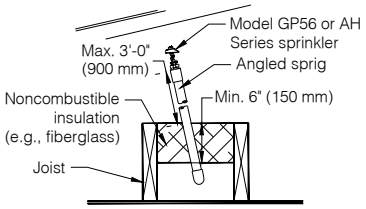
Branch lines over joists must be protected with a minimum 6" (150 mm) thickness of noncombustible insulation (e.g., fiberglass). A maximum of 3'-0" (900 mm) of an angled sprig may extend above the insulation to supply Model GP56 and AH Series sprinklers.



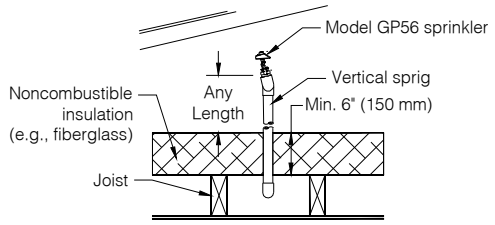
Branch lines over joists must be protected with a minimum 6" (150 mm) thickness of noncombustible insulation (e.g., fiberglass). A maximum of 10'-0" (3 m) of a vertical sprig may extend above the insulation to supply Model GP56 sprinklers.



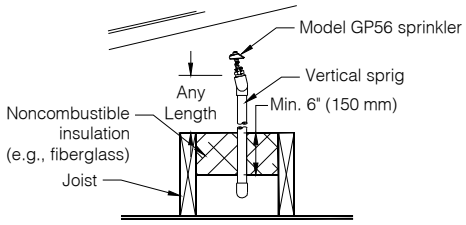
Branch lines between joists must be protected with a minimum 6" (150 mm) thickness of noncombustible insulation (e.g., fiberglass) either within the joist bay or on top of the joists. A maximum of 3'-0" (900 mm) of an angled sprig may extend above the insulation to supply Model GP56 and AH Series sprinklers.



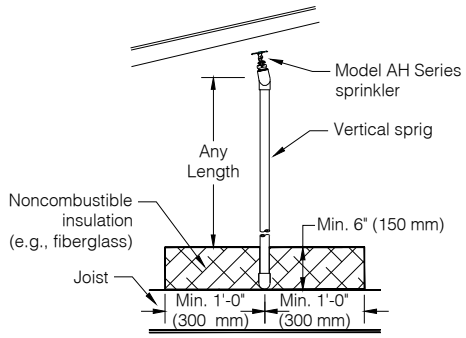
Branch lines between joists must be protected with a minimum 6" (150 mm) thickness of noncombustible insulation (e.g., fiberglass) either within the joist bay or on top of the joists. A maximum of 3'-0" (900 mm) of an angled sprig may extend above the insulation to supply Model GP56 and AH Series sprinklers.



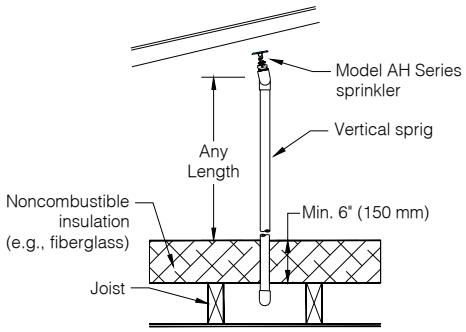
Branch lines between joists must be protected with a minimum 6" (150 mm) thickness of noncombustible insulation (e.g., fiberglass) either within the joist bay or on top of the joists. A maximum of 10'-0" (3 m) of a vertical sprig may extend above the insulation to supply Model GP56 sprinklers.



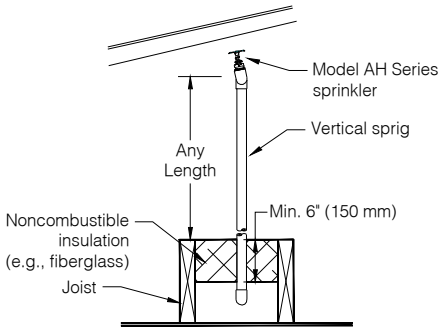
Branch lines between joists must be protected with a minimum 6" (150 mm) thickness of noncombustible insulation (e.g., fiberglass) either within the joist bay or on top of the joists. A maximum of 10'-0" (3 m) of a vertical sprig may extend above the insulation to supply Model GP56 sprinklers.



Branch lines over joists must be protected with a minimum 6" (150mm) thickness of noncombustible insulation (e.g., fiberglass). A vertical sprig of any length may extend above the insulation to supply Model AH Series sprinklers.



Branch lines over joists must be protected with a minimum 6" (150mm) thickness of noncombustible insulation (e.g., fiberglass) either within the joist bay or on top of the joists. A vertical sprig of any length may extend above the insulation to supply Model AH Series sprinklers.



Branch lines over joists must be protected with a minimum 6" (150mm) thickness of noncombustible insulation (e.g., fiberglass) either within the joist bay or on top of the joists. A vertical sprig of any length may extend above the insulation to supply Model AH Series sprinklers.

Caution:

1. Insulation required by Figures 30 and 31 is for fire protection purposes and not for freeze protection.
2. Follow installation requirements of the CPVC pipe manufacturer and listing, including vertifying compatibility of any insulation or other materials used with CPVC pipe.
3. Sprig ups to Model GP56 and AH Series sprinklers must be properly secured and supported in accordance with NFPA 13 requirements.

Installation

Model DD Series, Model GP56, and Model AH Series sprinklers are installed with the W2 wrench. The Model DS56 wrench is used to install Model DS56 sprinklers. The use of any other wrench to install Reliable Attic sprinklers is not permitted and may damage the sprinkler. Place the specified wrench over the sprinkler until the wrench engages the wrench flats. Do not wrench any other part of the sprinkler assembly. Tighten the sprinkler into the fitting after applying a PTFE based thread sealant to the sprinkler's threads. Recommended installation torque is specified in Table J.

Installation Torque — **Table J**

Sprinkler Threads	Recommended Installation Torque (min. – max.)	
	ft-lb	N·m
½" NPT or ISO7-1R1/2	8-18	11-24
¾" NPT or ISO7-1R3/4	14-20	19-27

Do not exceed the maximum recommended torque. Exceeding the maximum recommended torque may cause leakage or impairment of the sprinkler. Use care when placing or removing the wrench from the sprinkler to avoid damage to the sprinkler.

Installation Wrenches — **Figure 33**

Model W2 Wrench

For Models DD56, DD80, GP56, AH42, and AH56 sprinklers

Model DS56 Wrench

For Model DS56 sprinklers

Maintenance

Reliable Attic 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). Replace any sprinkler which has been damaged. 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.

Listing & Approval Agency

Underwriters Laboratories, Inc. and UL Canada (cULus)

Listing Category: Sprinklers, Automatic and Open

Guide Number: VNIV, VNIV7

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 (DD56-6, DD56-27, DD80-6, DD80-27, DS56, GP56, AH42, AH56)
- Threads (NPT or ISO 7-1)

Sprinkler Wrench

- Model W2 (for Model DD Series, Model GP56, and Model AH Series sprinklers)
- Model DS56 (for Model DS56 sprinklers)

P/N 9999970497

Spare Sprinkler Head Storage Cabinet

INSIST ON FPPI®

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 located to allow for the storage of a typical sprinkler head wrench. Each cabinet is finished with a red enamel finish. Each spare head cabinet comes with a hinged door which remains closed to protect the spare sprinklers from the elements and features two 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 two holes inside the cabinet, securing the cabinet securely to the wall. The insert the correct number and type of sprinklers in accordance with the “handbook”.

**Final determination is subject to approval by the AHJ.*

Specifications

Material:
Painted Plain Steel

Finish:
Red enamel

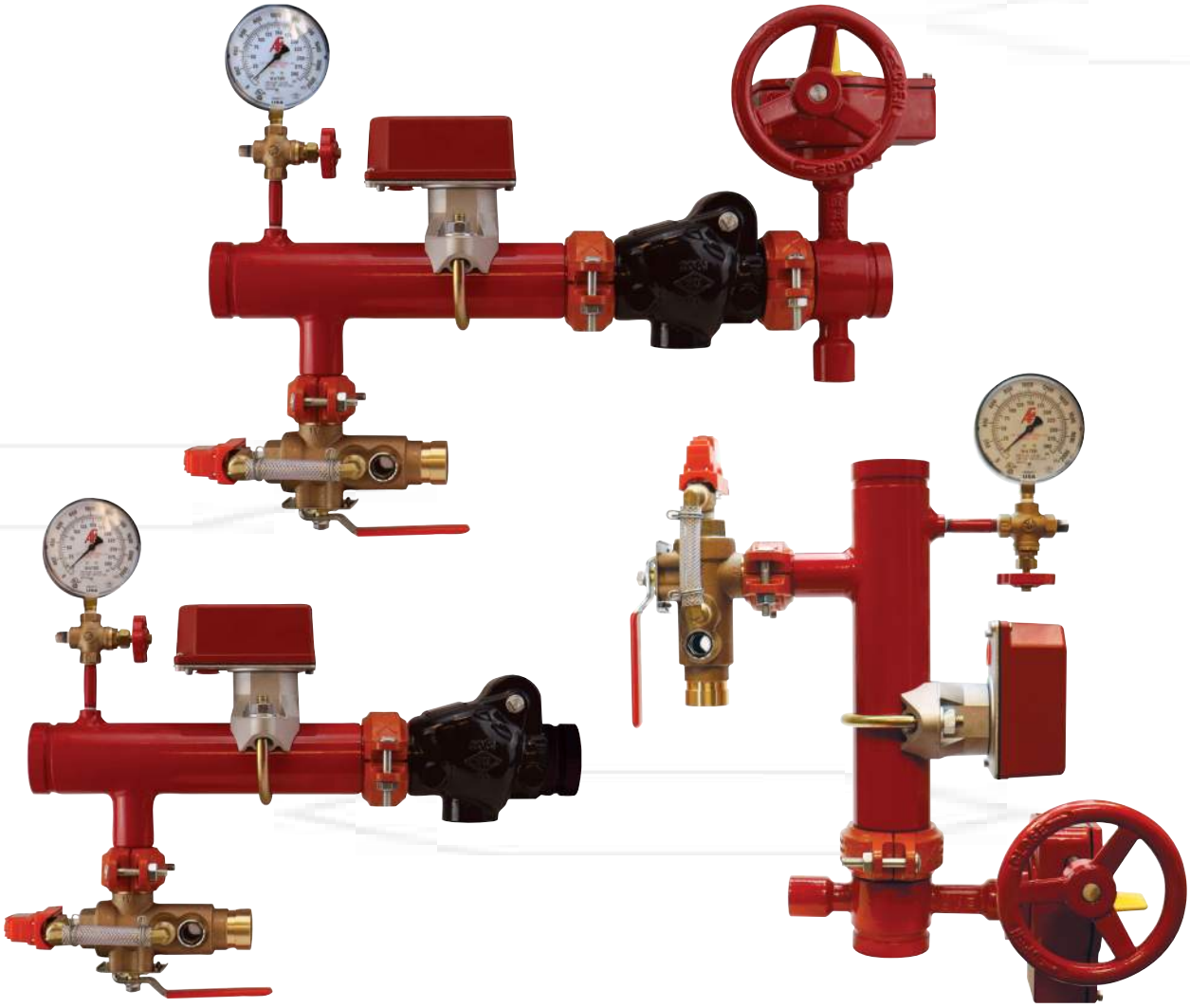
Styles:
3 Spare sprinklers, ½ or ¾
6 Spare sprinklers, ½ or ¾
6 Spare, ESFR, ½, ¾ or 1”
12 Spare sprinklers ½ or ¾
24 Spare sprinklers
36 Spare sprinklers

3198 LIONSHEAD AVE
CARLSBAD, CA 92010
TEL + 1 760 599-1168
+ 1 800 344-1822
FAX + 1 800 344-3775

AGF Manufacturing

RiserPACK®

ULTIMATE KITS



Butterfly Valve and Check Valve Kits

BR-RiserPACK-UltimateKits · 3/22

Ultimate RiserPACK Kits

AGF Ultimate Kits are floor control add-ons for RiserPACK models 8000, 8011, and 8611 (commercial steel risers only). Ultimate Kits give you the option of adding a butterfly valve, check valve, or butterfly valve and check valve upgrade to your RiserPACK. When you order a RiserPACK and one of the three Ultimate Kits the kit will come fully assembled on your 2"—4" model (6" and 8" Ultimate Kits are packaged separately and require assembly). Ultimate Kits fit both schedule 10 and schedule 40 manifolds and make you riser installation easier and more compact. All Ultimate RiserPACK models are UL Listed and FM Approved.

UL LISTED

FM APPROVED

Step 1: Choose a RiserPACK

AGF RiserPACK models 8000, 8011 and 8611 are compact, fully-assembled risers designed for NFPA 13 wet pipe fire sprinkler systems. All AGF risers feature an appropriately sized TESTanDRAIN model 2500 or 2511 for system testing and draining. NFPA 13 standards require the addition of a pressure relief valve on all wet pipe systems, and all 8011 and 8611 RiserPACK models include an AGF Model 7000L pressure relief valve. The model 7000L has a lock-out feature that closes access to it's outlet, which means *it does not have to be removed from the system prior the hydrostatic testing*. This helps save valuable time while testing. With the addition of an Ultimate Kit, the Ultimate RiserPACK is a complete floor control assembly that saves time and money on system installations.

8000

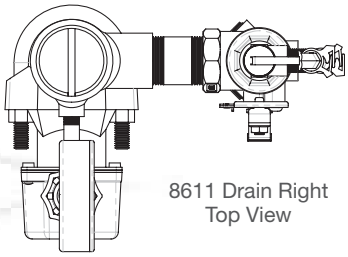
8011

7000L

Includes a lock-out feature so it does not have to be removed from the system during hydrostatic testing.

8611 Drain Right

8611 Drain Left



8611 Drain Right Top View

See Back Cover to Generate an Ultimate RiserPACK Part Number

Step 2: Choose an Ultimate Kit

AGF will ship the Ultimate Kit fully assembled on your choice of 2"—4" RISERPACK; 6" and 8" kits require assembly. All kit components are field adjustable and can be rotated to accommodate operation requirements or installation restrictions, and all Ultimate RISERPACK models can be oriented vertically or horizontally. All kit components can be easily replaced by off-the-shelf parts and are easily retrofitted back onto the system. **See back cover to generate a part number.**

BFV Kit

Kit Includes: Butterfly Valve and Grooved Coupling

Butterfly Valve Kit	
2"	BFV-20
2½"	BFV-25
3"	BFV-30
4"	BFV-40
6"	BFV-60
8"	BFV-80

CKV Kit

Kit Includes: Check Valve and Grooved Coupling

Check Valve Kit	
2"	CKV-20
2½"	CKV-25
3"	CKV-30
4"	CKV-40
6"	CKV-60
8"	CKV-80

BFVCKV Kit

Kit Includes: Butterfly Valve, Check Valve, and Two Grooved Couplings

Butterfly & Check Valve Kit	
2"	BFVCKV-20
2½"	BFVCKV-25
3"	BFVCKV-30
4"	BFVCKV-40
6"	BFVCKV-60
8"	BFVCKV-80

Ultimate RISERPACK Vertical and Horizontal Orientation

All components can be rotated to accommodate operation requirements or installation restrictions.

BFV Kit

CKV Kit

BFVCKV Kit

Generating a Part Number

To generate a part number for a RiserPACK with an Ultimate Kit use the chart below.

Example:

The part number for a 4" Model 8011 with a 5.6K orifice and a Butterfly Valve Kit (BFV) is demonstrated below. First, take the part number for the RiserPACK and add the part number for the desired Ultimate Kit.

Step 1		Step 2		Part Number
RiserPACK		**Ultimate Kit**		**Ultimate RiserPACK**
8482A	+	BFV-40	=	8482A-BFV-40

		RiserPACK Part Numbers						
		Orifice Size		2”	2½”	3”	4”	6”	8"
		K-Factor	Fractional						
Step 1	Model 8000	2.8	3/8”	8355A	8360A	8370A	8380A	8390A	8398A-28
		4.2	7/16”	8356A	8361A	8371A	8381A	8391A	8398A-42
		5.6	**1/2”**	**8357A**	**8362A**	**8372A**	**8382A**	**8392A**	8398A-56
		8.0	17/32”	8358A	8363A	8373A	8383A	8393A	8398A-80
		11.2 (ELO)	5/8”	8359A	8364A	8374A	8384A	8394A	8398A-112
		14.0 (ESFR)	3/4"	N/A	8365A	8375A	8385A	8395A	8398A-140
		25.2	-	N/A	N/A	N/A	8386A	8396A	8398A-252
	Model 8011	2.8	3/8”	8455A	8460A	8470A	8480A	8490A	8498A-28
		4.2	7/16”	8456A	8461A	8471A	8481A	8491A	8498A-42
		5.6	**1/2”**	**8457A**	**8462A**	**8472A**	**8482A**	**8492A**	8498A-56
		8.0	17/32”	8458A	8463A	8473A	8483A	8493A	8498A-80
		11.2 (ELO)	5/8”	8459A	8464A	8474A	8484A	8494A	8498A-112
		14.0 (ESFR)	3/4"	N/A	8465A	8475A	8485A	8495A	8498A-140
		25.2	-	N/A	N/A	N/A	8486A	8496A	8498A-252
	Model 8611 (Right)	2.8	3/8”	8655A	8660A	8670A	8680A	8690A	N/A
		4.2	7/16”	8656A	8661A	8671A	8681A	8691A	N/A
		5.6	**1/2”**	**8657A**	**8662A**	**8672A**	**8682A**	**8692A**	N/A
		8.0	17/32”	8658A	8663A	8673A	8683A	8693A	N/A
		11.2 (ELO)	5/8”	8659A	8664A	8674A	8684A	8694A	N/A
		14.0 (ESFR)	3/4"	N/A	8665A	8675A	8685A	8695A	N/A
		25.2	-	N/A	N/A	N/A	8686A	8696A	N/A
	Model 8611 (Left)	2.8	3/8”	8655LDG	8660LDG	8670LDG	8680LDG	8690LDG	N/A
		4.2	7/16”	8656LDG	8661LDG	8671LDG	8681LDG	8691LDG	N/A
		5.6	**1/2”**	**8657LDG**	**8662LDG**	**8672LDG**	**8682LDG**	**8692LDG**	N/A
		8.0	17/32”	8658LDG	8663LDG	8673LDG	8683LDG	8693LDG	N/A
		11.2 (ELO)	5/8”	8659LDG	8664LDG	8674LDG	8684LDG	8694LDG	N/A
		14.0 (ESFR)	3/4"	N/A	8665LDG	8675LDG	8685LDG	8695LDG	N/A
		25.2	-	N/A	N/A	N/A	8686LDG	8696LDG	N/A
Step 2	Ultimate Kit Part Numbers								
	BFV Kit			BFV-20	BFV-25	BFV-30	BFV-40	BFV-60	BFV-80
	CKV Kit			CKV-20	CKV-25	CKV-30	CKV-40	CKV-60	CKV-80
	BFVCKV Kit			BFVCKV-20	BFVCKV-25	BFVCKV-30	BFVCKV-40	BFVCKV-60	BFVCKV-80

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Model DPV-1 Dry Pipe Valve External Resetting

General Description

The TYCO Model DPV-1 Dry Pipe Valves are differential valves used to automatically control the flow of water into dry pipe fire protection sprinkler systems upon operation of one or more automatic sprinklers. The DPV-1 also provides for actuation of fire alarms upon system operation. The Model DPV-1 features are as follows:

- External reset.
- 250 psi (17,2 bar) pressure rating.
- Unique offset single clapper design enabling a simple compact valve to minimize installation labor.
- Ductile iron construction to ensure a lightweight valve to minimize shipping cost.
- A variety of inlet and outlet connections.
- Compact, Pre-Trimmed, and Semi-Assembled, easy to operate valve trim.
- Simple reset procedure through the elimination of priming water.

Dry pipe sprinkler systems are used in unheated warehouses, parking garages, store windows, attic spaces, loading docks, and other areas exposed to freezing temperatures, where water filled pipe cannot be utilized. When set for service, the dry pipe sprinkler system is pressurized with air (or nitrogen). The loss of pressure through an operated automatic sprinkler in response to heat from a fire permits the DPV-1 Dry Pipe Valve to open and allow a flow of water into the sprinkler system piping. Table B establishes the minimum required system air pressure that includes a safety factor to help prevent false operations that might occur due to water supply fluctuations.

NOTICE

The Model DPV-1 Dry Pipe Valves described herein must be installed and maintained in compliance with this document, as well as with the applicable standards of the National Fire Protection Association, in addition to the standards of any other authorities having jurisdiction. Failure to do so may impair the performance of these devices.

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

Available Sizes and End Connections

End Connection	Nominal Valve Size			
	2-1/2 Inch (DN65)	3 Inch (DN80)	4 Inch (DN100)	6 Inch (DN150)
Flange x Flange	N/A	N/A	•	•
Flange x Groove	N/A	N/A	•	•
Groove x Groove	•	•	•	•

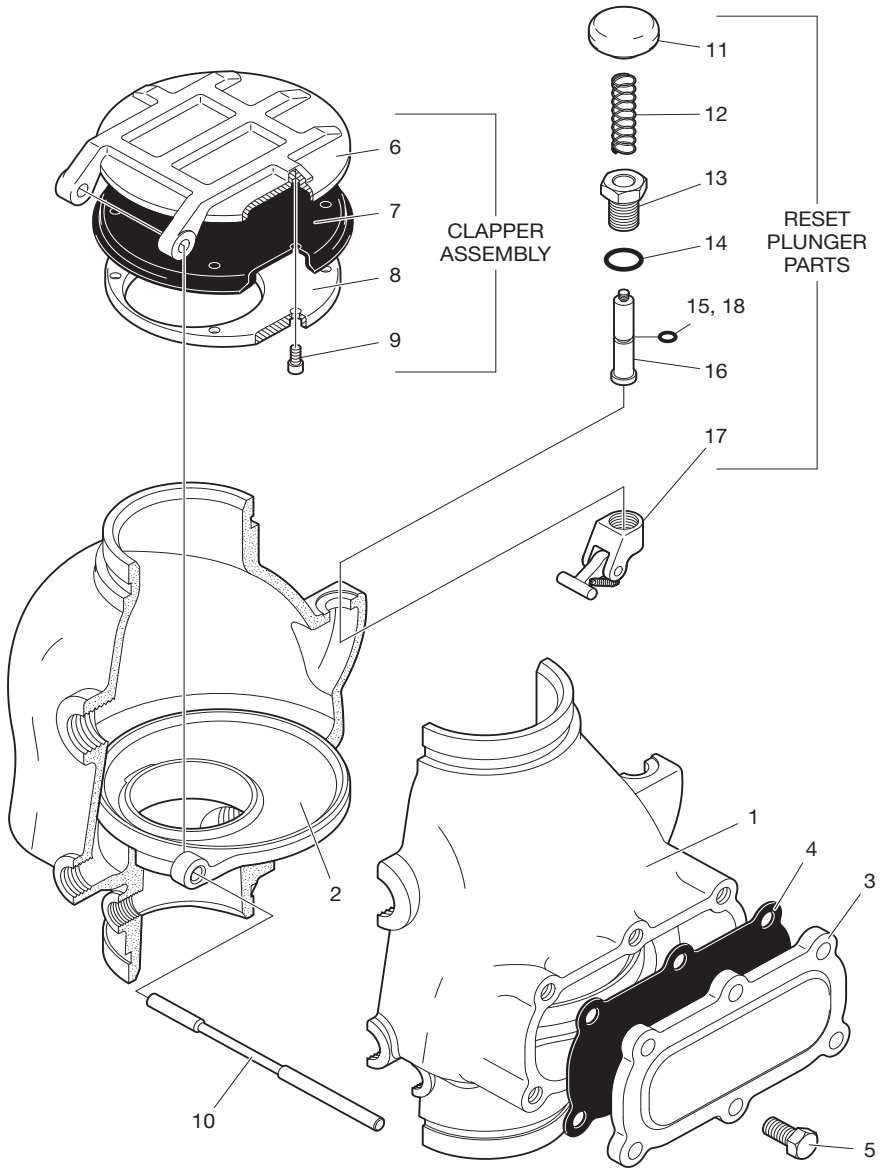
• = Available
N/A = Not Available

Technical Data

Approvals
UL and C-UL Listed
FM Approved
NYC Approved

Dry Pipe Valve
The TYCO Model DPV-1 Dry Pipe Valves shall be installed in the vertical orientation only (supply at bottom flowing upward) and are rated for use at a maximum service pressure of 250 psi (17,2 bar). Valve and trim dimensions are shown in Figure 6.

Flanged connections are available and drilled per ANSI, ISO, AS, and JIS specifications (Ref. Table A). The grooved outlet connections, as applicable, are cut in accordance with standard groove specifications for steel pipe. They are suitable for use with grooved end pipe couplings that are listed or approved for fire protection system service. Available combinations of inlet and outlet connections are described in the



NO.	DESCRIPTION	QTY.	REF.
1	Valve Body	1	NR
2	Air and Water Seat	1	NR
3	Handhole Cover	1	NR
4	Handhole Cover Gasket	1	(b)
5	1/2-13 UNC x 1" Hex Head Cap Screw: 2-1/2 & 3 Inch Valves	5	CH
	4 Inch Valve	6	CH
6	Clapper	1	(a)
7	Clapper Facing	1	(a) or (b)
8	Clapper Facing Retaining Plate	1	(a)
9	2-1/2 and 3 Inch Valves: 1/4" x 3/8" Long #10-32 Shoulder Screw	5	(a)
	4 Inch Valve: 1/4-20 UNC x 1/2" Socket Head Cap Screw	7	(a)
10	Clapper Hinge Pin	1	(a)
11	Reset Knob	1	(c) or (d)
12	Reset Spring	1	(c)
13	Reset Bushing	1	(c)
14	Reset Bushing O-Ring	1	(b), (c) or (e)
15	Reset Plunger O-Ring	1	(b) or (c)
16	Reset Plunger	1	(c)
17	Reset Latch Subassembly	1	(c)
18	Dow Corning FS3452 Flourosilicone Grease, 1.5 g	1	(b) or (c)

NR: Not Replaceable
CH: Common Hardware

REPLACEMENT PARTS

NO.	DESCRIPTION	P/N
(a)	Clapper Assembly Includes Items 6-10:	
	2-1/2 & 3 Inch Valves	92-310-2-203
	4 Inch Valve	92-310-2-403
(b)	Repair Parts Kit Includes Items 4, 7, 14, 15, & 18:	
	2-1/2 & 3 Inch Valves	92-310-1-204
	4 Inch Valve	92-310-1-404
(c)	Reset Plunger Parts Kit Includes Items 11-18	92-310-1-405
(d)	Reset Knob, Item 11.	92-310-1-406
(e)	Reset Bushing O-Ring, Item 14	92-310-1-407

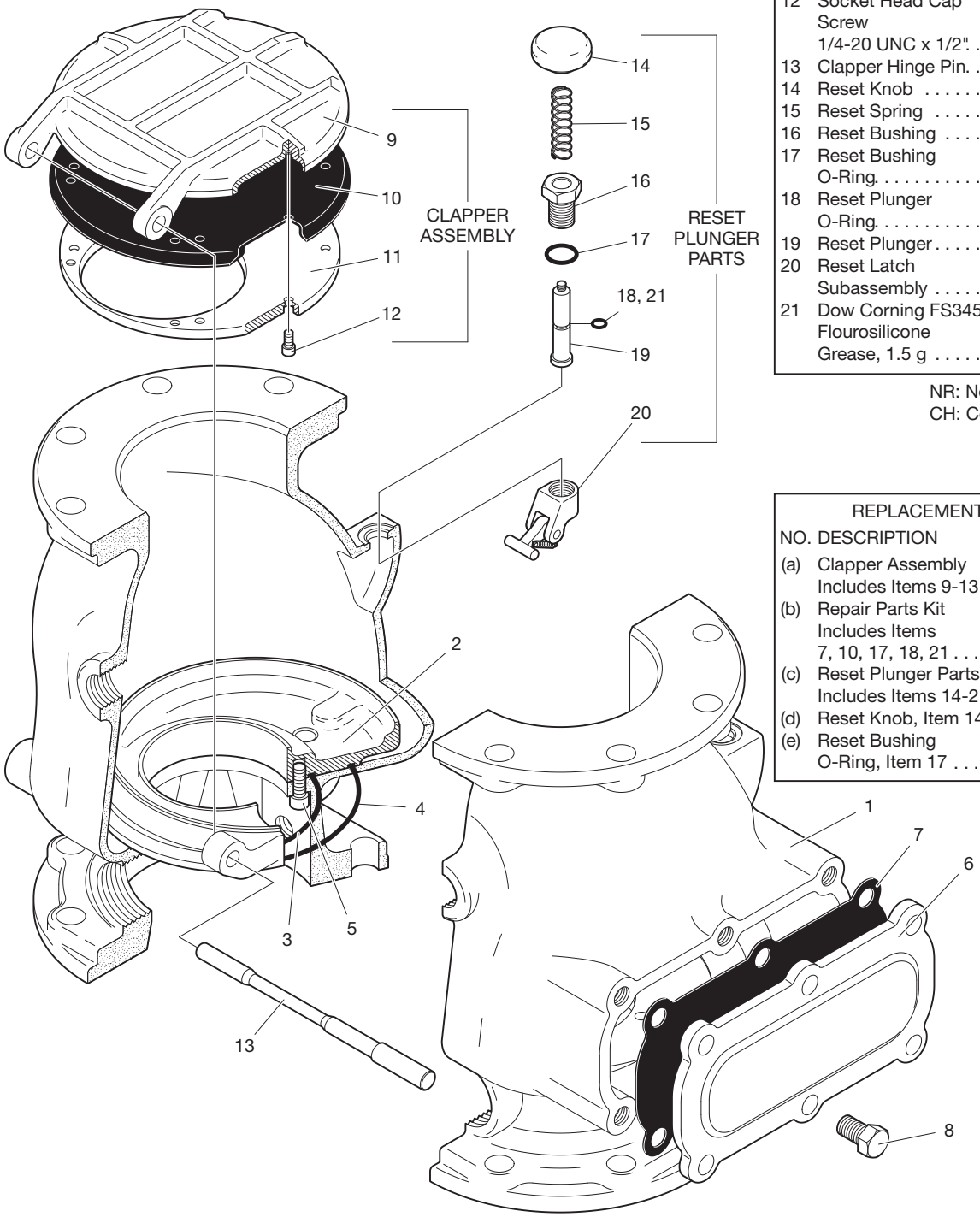
FIGURE 1 - PART 1 OF 2
MODEL DPV-1 DRY PIPE VALVE
2-1/2, 3, AND 4 INCH (DN65, DN80, DN100) ASSEMBLIES

NO.	DESCRIPTION	QTY.	REP. PART
1	Valve Body	1	NR
2	Air and Water Seat	1	NR
3	Water Seal O-Ring	1	NR
4	Air Seal O-Ring	1	NR

NO.	DESCRIPTION	QTY.	REP. PART
5	Socket Head Cap Screw 3/8-16 UNC x 1"	8	NR
6	Handhole Cover	1	NR
7	Handhole Cover Gasket	1	(b)

NO.	DESCRIPTION	QTY.	REP. PART
8	Hex Head Cap Screw 5/8-11 UNC x 1"	6	CH
9	Clapper	1	(a)
10	Clapper Facing	1	(a) or (b)
11	Clapper Facing Retaining Plate	1	(a)
12	Socket Head Cap Screw 1/4-20 UNC x 1/2"	9	(a)
13	Clapper Hinge Pin	1	(a)
14	Reset Knob	1	(c) or (d)
15	Reset Spring	1	(c)
16	Reset Bushing	1	(c)
17	Reset Bushing O-Ring	1	(b), (c) or (e)
18	Reset Plunger O-Ring	1	(b) or (c)
19	Reset Plunger	1	(c)
20	Reset Latch Subassembly	1	(c)
21	Dow Corning FS3452 Flourosilicone Grease, 1.5 g	1	(b) or (c)

NR: Not Replaceable
CH: Common Hardware



REPLACEMENT PARTS		
NO.	DESCRIPTION	P/N
(a)	Clapper Assembly Includes Items 9-13	92-310-2-603
(b)	Repair Parts Kit Includes Items 7, 10, 17, 18, 21	92-310-1-604
(c)	Reset Plunger Parts Kit Includes Items 14-21	92-310-1-405
(d)	Reset Knob, Item 14	92-310-1-406
(e)	Reset Bushing O-Ring, Item 17	92-310-1-407

FIGURE 1 - PART 2 OF 2
MODEL DPV-1 DRY PIPE VALVE
6 INCH (DN150) ASSEMBLY

Nominal Valve Size	Flange Drilling Specification											
	Nominal Dimensions in Inches and (mm)											
	ANSI B16.1[1] (Class 125)			ISO 7005-2 (PN16)[2]			JIS B 2210 (10K)			AS 2129 (Table E)		
	Dim. A	Dim. B	Qty. N	Dim. A	Dim. B	Qty. N	Dim. A	Dim. B	Qty. N	Dim. A	Dim. B	Qty. N
4 Inch (DN100)	7.50 (190,5)	0.75 (19,0)	8	7.09 (180,0)	0.75 (19,0)	8	6.89 (175,0)	0.59 (15,0)	8	7.00 (178,0)	0.71 (18,0)	8
6 Inch (DN150)	9.50 (241,3)	0.88 (22,2)	8	9.45 (240,0)	0.91 (23,0)	8	9.45 (240,0)	0.75 (19,0)	8	9.25 (235,0)	0.87 (22,0)	8

1. Drilling same as ANSI B16.5 (Class 150) and ANSI B16.42 (Class 150).
2. Drilling same as BS 4504 Section 3.2 (PN16) and DIN 2532 (PN16).

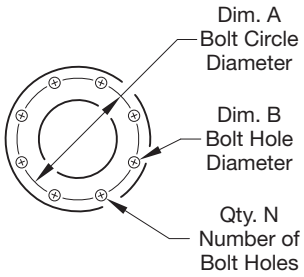


TABLE A
SELECTION OF FLANGE DRILLING SPECIFICATIONS

Ordering Procedure section and in the "Available End Connection and Sizes" table above.

Trim port connections of valves having flanges drilled to ANSI, AS, or JIS specifications are NPT threaded per ANSI Standard B1.20.1. Trim port connections of valves having flanges drilled to ISO are available either threaded per ISO 7-1 or NPT threaded per ANSI Standard B1.20.1. Valves with NPT threaded ports will readily accept the trim arrangements shown in Parts 2 and 3 of Figures 3, 4, and 5.

Model DPV-1 Valve assemblies are shown in Figure 1. The Body and Handhole Cover are ductile iron. The Handhole Cover Gasket is neoprene, and the Clapper Facing is EPDM. The Air/Water Seat Ring is brass, the Clapper is bronze or aluminum bronze, and both the Clapper Retaining Plate and Latch are bronze. The Hinge Pin is aluminum bronze, and the fasteners for the Handhole Cover are carbon steel.

Valve Trim
Installation dimensions are provided in Figure 6, and Valve Trim and Pre-Trimmed Valve Assemblies are shown in Figures 3, 4, and 5.

The valve trim, ordered separately or as a pre-trimmed valve assembly, forms a part of the laboratory listings and approvals of the DPV-1 Valve and is necessary for the proper operation of the DPV-1 Valve.

Trim packages or pre-trimmed valve assemblies include the following equipment:

- Water Supply Pressure Gauge
- System Air Pressure Gauge
- Air Supply Connections
- Main Drain Valve
- Low Body Drain Valve
- Alarm Test Valve
- Automatic Drain Valve
- Drip Funnel
- Connections For Optional Quick Opening Device (Accelerator)

Pre-trimmed valve assemblies also include the following equipment:

- Model BFV-300 butterfly valve
- Figure 577 grooved coupling
- PS10-2 waterflow alarm switch
- PS40-2 low air pressure alarm switch

Order the above equipment separately when ordering trim packages separately.

Note: *When the system pressure is greater than 175 psi (12,1 bar), provision shall be made to replace the standard order 300 psi (20,7 bar) Water Pressure gauge with a separately ordered 600 psi (41,4 bar) Water Pressure Gauge.*

Weights
The following are the nominal weights for Pre-Trimmed Valve Assemblies, Semi-Assembled Trim, and DPV-1 Valves without trim.

Pre-Trimmed DPV-1 Valve Assemblies:

2-1/2 Inch (DN65) GxG 87lbs (40kg)

3 Inch (DN80) GxG.....90lbs (42kg)

4 Inch (DN100) GxG.....121lbs.(56kg)

4 Inch (DN100) FxG.....135lbs (64kg)

4 Inch (DN100) FxF 145bs (69kg)

6 Inch (DN150) GxG..... 175lbs (81kg)

6 Inch (DN150) FxG.....195lbs (90kg)

6 Inch (DN150) FxF 208lbs (96kg)

Standard Galvanized Semi-Assembled DPV-1 Trim:

2-1/2 Inch (DN65).....23lbs (11kg)

3 Inch (DN80).....23lbs (11kg)

4 Inch (DN100) 30lbs (14kg)

6 Inch (DN150) 30lbs (14kg)

DPV-1 Valve (Without Trim):

2-1/2 Inch (DN65) GxG 37lbs (17kg)

3 Inch (DN80) GxG..... 38lbs (18kg)

4 Inch (DN100) GxG..... 57lbs (26kg)

4 Inch (DN100) FxG.....67lbs (31kg)

4 Inch (DN100) FxF 77lbs (36kg)

6 Inch (DN150) GxG..... 95lbs (44kg)

6 Inch (DN150) FxG..... 108lbs (50kg)

6 Inch(DN150) FxF 121lbs (56kg)

Air Supply
Table B shows the system air pressure requirements as a function of the water supply pressure. The air (or nitrogen) pressure in the sprinkler system is recommended to be automatically maintained by using one of the following pressure maintenance devices, as appropriate:

- Model AMD-1 Air Maintenance Device (pressure reducing type)
- Model AMD-2 Air Maintenance Device (compressor control type)
- Model AMD-3 Nitrogen Maintenance Device (high pressure reducing type)

The Pressure Relief Valve provided with the valve trim is factory set to relieve at a pressure of approximately 45 psi (3,1 bar). If the normal system air pressure is less than or exceeds 40 psi (2,8 bar), then the pressure Relief Valve must be reset to relieve at a pressure that is in accordance with the authority having jurisdiction.

Quick Opening Device
The Model DPV-1 Dry Pipe Valve may optionally be equipped with an electronic or mechanical dry pipe valve accelerator. Select the VIZOR Electronic Dry Pipe Valve Accelerator (4 and 6 inch sizes only) described in Technical Data Sheet TFP1105 or the Model ACC-1 Mechanical Dry Pipe Valve Accelerator (2-1/2 through 6 inch sizes) described in Technical Data Sheet TFP1112.

The VIZOR or the ACC-1 is used to reduce the time to valve actuation following the operation of one or more automatic sprinklers. In some cases the use of a quick opening device such as the VIZOR or the ACC-1 may

Maximum Water Supply Pressure psi	System Air Pressure Range psi
20	10
60	15 - 23
80	20 - 28
100	25 - 33
120	30 - 38
145	35 - 43
165	40 - 48
185	45 - 53
205	50 - 58
225	55 - 63
250	60 - 68

TABLE B
SYSTEM AIR PRESSURE REQUIREMENTS

be required to meet the requirements of the National Fire Protection Association to meet water delivery times.

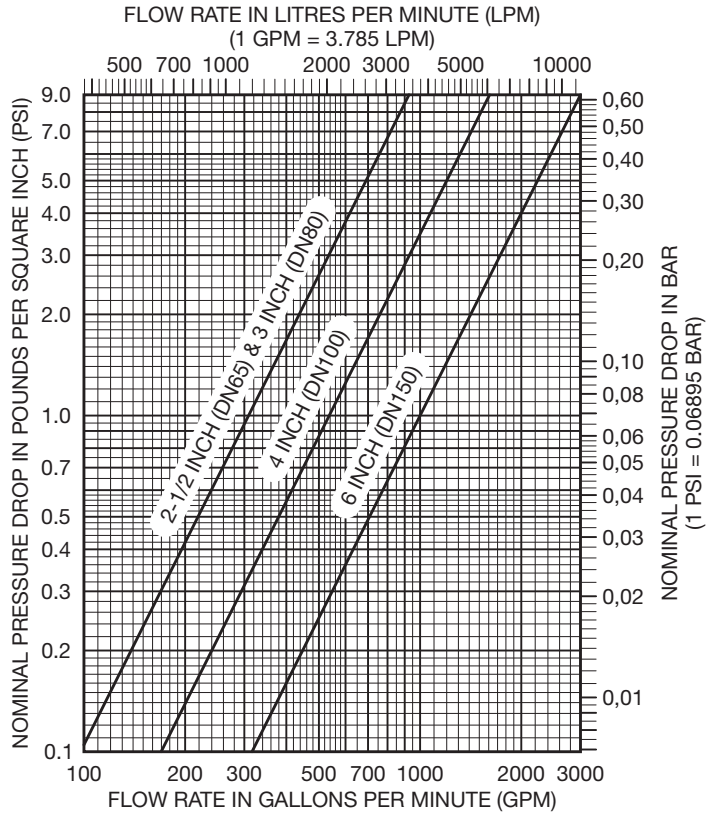
Operation

The TYCO Model DPV-1 Dry Pipe Valve is a differential type valve that utilizes a substantially lower system (air or nitrogen) pressure than the supply (water) pressure, to maintain the set position shown in Figure 2A. The differential nature of the DPV-1 is based on the area difference between the air seat and the water seat in combination with the ratio of the radial difference from the Hinge Pin to the center of the Water Seat and the Hinge Pin to the center of the Air Seat. The difference is such that 1 psi (0,07 bar) of system air pressure can hold approximately 5.5 psi (0,38 bar) of water supply pressure.

Table B establishes the minimum required system air pressure that includes a safety factor to help prevent false operations that occur due to water supply fluctuations.

The Intermediate Chamber of the DPV-1 is formed by the area between the Air Seat and Water Seat as shown in Figure 2B. The Intermediate Chamber normally remains at atmospheric pressure through the Alarm Port connection and the valve trim to the normally open Automatic Drain Valve (Fig. 3, 4, or 5). Having the Intermediate Chamber, Figure 2B, open to atmosphere is critical to the DPV-1 Valve remaining set, otherwise the full resulting pressure of the system air pressure on top of the Clapper Assembly cannot be realized.

For example, and assuming a water supply pressure of 100 psi (6,9 bar), if the system air pressure is 25 psi (1,7 bar) and there was 15 psi (1,0 bar) pressure trapped in the Intermediate Chamber, the resulting pressure across



The approximate friction losses, based on the Hazen and Williams formula and expressed in equivalent length of Schedule 40 pipe with C=100 and flowing at typical flow rates, are as follows:

2-1/2 inch valve at 250 GPM flow = 2.2 feet
3 inch valve at 350 GPM flow = 4.9 feet
4 inch valve at 600 GPM flow = 8.9 feet
6 inch valve at 1500 GPM flow = 22.0 feet

GRAPH A
MODEL DPV-1 DRY PIPE VALVES
NOMINAL PRESSURE LOSS VS. FLOW

the top of the Clapper would only be 10 psi (0,7 bar). This pressure would be insufficient to hold the Clapper Assembly closed against a water supply pressure of 100 psi (6,9 bar). It is for this reason that the plunger of the Automatic Drain Valve must be depressed during several of the resetting steps, as well as during inspections, making certain that the Automatic Drain Valve is open.

When one or more automatic sprinklers operate in response to a fire, air pressure within the system piping is relieved through the open sprinklers. When the air pressure is sufficiently reduced, the water pressure overcomes the differential holding the Clapper Assembly closed and the Clapper Assembly swings clear of the water seat, as shown in Figure 2C, This action permits water flow into the system piping and subsequently to be discharged from any open sprinklers. Also, with the Clapper Assembly open, the intermediate chamber is pressurized and water flows through the alarm port (Ref. Figure 2B) at the rear of the DPV-1 Valve to actuate system water flow alarms. The flow from the alarm port is also sufficient to close the otherwise normally open Automatic Drain Valve in the valve trim.

After a valve actuation and upon subsequent closing of a system main control valve to stop water flow, the Clapper Assembly will latch open as shown in Figure 3D. Latching open of the DPV-1 will permit complete draining of the system (including any loose scale) through the main drain port.

During the valve resetting procedure and after the system is completely drained, the external reset knob can be easily depressed to externally unlatch the Clapper Assembly, as shown in Figure 2E. As such, the Clapper Assembly is returned to its normal set position to facilitate setting of the dry pipe sprinkler system, without having to remove the Handhole Cover.

Installation

General Instructions
Proper operation of the Model DPV-1 Dry Pipe Valve depends upon its trim being installed in accordance with the instructions given in this Technical Data Sheet. Failure to follow the appropriate trim diagram may prevent the DPV-1 Valve from functioning properly, as well as void listings, approvals, and the manufacturer warranties.

Failure to latch open the Clapper Assembly prior to a system hydrostatic test may result in damage to the Clapper Assembly.

The DPV-1 Valve must be installed in a readily visible and accessible location.

The DPV-1 Valve and associated trim must be maintained at a minimum temperature of 40°F (4°C).

Heat tracing of the DPV-1 Valve or its associated trim is not permitted. Heat tracing can result in the formation of hardened mineral deposits that are capable of preventing proper operation.

The Model DPV-1 Dry Pipe Valve is to be installed in accordance with the following criteria:

- All nipples, fittings, and devices must be clean and free of scale and burrs before installation. Use pipe thread sealant sparingly on male pipe threads only.
- The DPV-1 Valve must be trimmed in accordance with Figures 3, 4, or 5, as applicable. If the DPV-1 is to be equipped with a Dry Pipe Valve Accelerator, refer to the Technical Data Sheet TFP1105 for the VIZOR Electronic Dry Pipe Valve Accelerator or TFP1112 for the Model ACC-1 Mechanical Dry Pipe Valve Accelerator.
- Care must be taken to make sure that check valves, strainers, globe valves, etc. are installed with the flow arrows in the proper direction.
- Drain tubing to the drip funnel must be installed with smooth bends that will not restrict flow.
- The main drain and drip funnel drain may be interconnected provided a check valve is located at least 12 inches (300 mm) below the drip funnel. The Low Body Drain Valve (Figure 3, 4, or 5) may be piped so as to discharge into the Drip Funnel or to a separate drain.
- Suitable provision must be made for disposal of drain water. Drainage water must be directed such that it will not cause accidental damage to property or danger to persons.
- Unused pressure alarm switch and/or water motor alarm connections must be plugged.
- The Pressure Relief Valve provided with the Valve Trim is factory set to relieve at a pressure of approximately 45 psi (3,1 bar), which can typically be used for a maximum normal system air pressure of 40 psi (2,8 bar). The Pressure Relief Valve may be reset to a lower or higher pressure; however, it must be reset to relieve at a pressure which is in accordance with the requirements of the authority having jurisdiction.

  To reset the Pressure Relief Valve, first loosen the jam nut and then adjust the cap accordingly — clockwise for a higher pressure setting or counter-clockwise for a lower pressure setting. After verifying the desired pressure setting, tighten the jam nut.
- Installation of an Air Maintenance Device, as described in the Technical Data Section, is recommended.
- An Inspector's Test Connection as required By NFPA 13 must be provided on the system piping at the most remote location from the Model DPV-1 Valve.
- Conduit and electrical connections are to be made in accordance with the requirements of the authority having jurisdiction and/or the National Electric Code.
- Before a system hydrostatic test is performed in accordance with NFPA 13 system acceptance test requirements, the Clapper Assembly is to be manually latched open (Ref. Figure 2D); the Automatic Drain Valve (Figure 3, 4, or 5) is to be temporarily replaced with a 1/2 inch NPT plug, the 3/32 inch Vent Fitting (Item 13, Figure 3; Item 15, Figure 4; or Item 15, Figure 5) is to be temporarily replaced with a 1/4 inch NPT plug, and the Handhole Cover Bolts are to be tightened using a cross-draw sequence.

Valve Setting Procedure

Steps 1 through 11 are to be performed when initially setting the Model DPV-1 Dry Pipe Valve; after an operational test of the fire protection system; or, after system operation due to a fire.

NOTES: *If the DPV-1 is equipped with a Dry Pipe Valve Accelerator, refer to its resetting instructions before resetting the DPV-1. Refer to TFP1105 for the VIZOR or TFP1112 for the ACC-1.*

Based on the instructions provided, reset the Accelerator at the appropriate time during the resetting of the DPV-1.

Unless otherwise noted, refer to Figure 3, 4, or 5 to identify functional trim components.

Step 1. Close the Main Control Valve, and close the Air Supply Control Valve. If the DPV-1 is equipped with a Dry Pipe Valve Accelerator, remove the Dry Pipe Valve Accelerator from service in accordance with its Technical Data Sheet (Refer to TFP1105 for the VIZOR or TFP1112 for the ACC-1).

Step 2. Open the Main Drain Valve and all auxiliary drains in the system. Close the auxiliary drain valves after water ceases to discharge. Leave the Main Drain Valve open.

Step 3. Depress the plunger of the Automatic Drain Valve to verify that it is open and that the DPV-1 Valve is completely drained.

Step 4. Open the Optional Alarm Control Valve, as applicable, if it was closed to silence local alarms.

Step 5. As necessary, replace all sprinklers that have operated. Replacement sprinklers must be of the same type and temperature rating as those which have operated.

NOTICE

In order to prevent the possibility of a subsequent operation of an overheated solder type sprinkler, any solder type sprinklers which were possibly exposed to a temperature greater than their maximum rated ambient must be replaced.

Step 6. Push down on the Reset Knob (Figure 2E) to allow the Clapper Assembly to re-seat.

Step 7. Pressurize the system with air (or nitrogen) to 10 psi (0,7 bar), and then individually open all auxiliary drain valves in the system piping to drain any remaining water in trapped sections. Close each drain valve as soon as water ceases to discharge.

Also partially open the Low Body Drain Valve to assure that the riser is completely drained. Close the Low Body Drain Valve as soon as water ceases to discharge.

Step 8. Refer to Table B and then restore the system to the normal system air pressure as necessary to hold the DPV-1 Valve closed.

Step 9. Depress the plunger on the Automatic Drain Valve to make sure it is open and that there is no air discharging.

The absence of air discharging from the Automatic Drain Valve is an indication of a properly set air seat within the DPV-1 Valve. If air is discharging, refer to the Care and Maintenance section under Automatic Drain Valve Inspection to determine/correct the cause of the leakage problem.

Step 10. Partially open the Main Control Valve. Slowly close the Main Drain Valve as soon as water discharges from the drain connection.

Depress the plunger on the Automatic Drain Valve to make sure that it is open and that there is no water discharging. The absence of water discharging from the Automatic Drain Valve is an indication of a properly set water seat within the DPV-1 Valve. If water is discharging, refer to the Care and Maintenance section under the Automatic Drain Valve Inspection to determine/correct the cause of the leakage problem.

If there are no leaks, the DPV-1 Valve is ready to be placed in service and the Main Control Valve must then be fully opened.

Note: *After setting a fire protection system, notify the proper authorities and advise those responsible for monitoring proprietary and/or central station alarms.*

Step 11. Once a week after a valve is reset following an operational test or system operation, the Low Body Drain Valve (and any low point drain valves) should be partially opened (and then subsequently closed) to relieve drain-back water. Continue this procedure until drain-back water is no longer present.

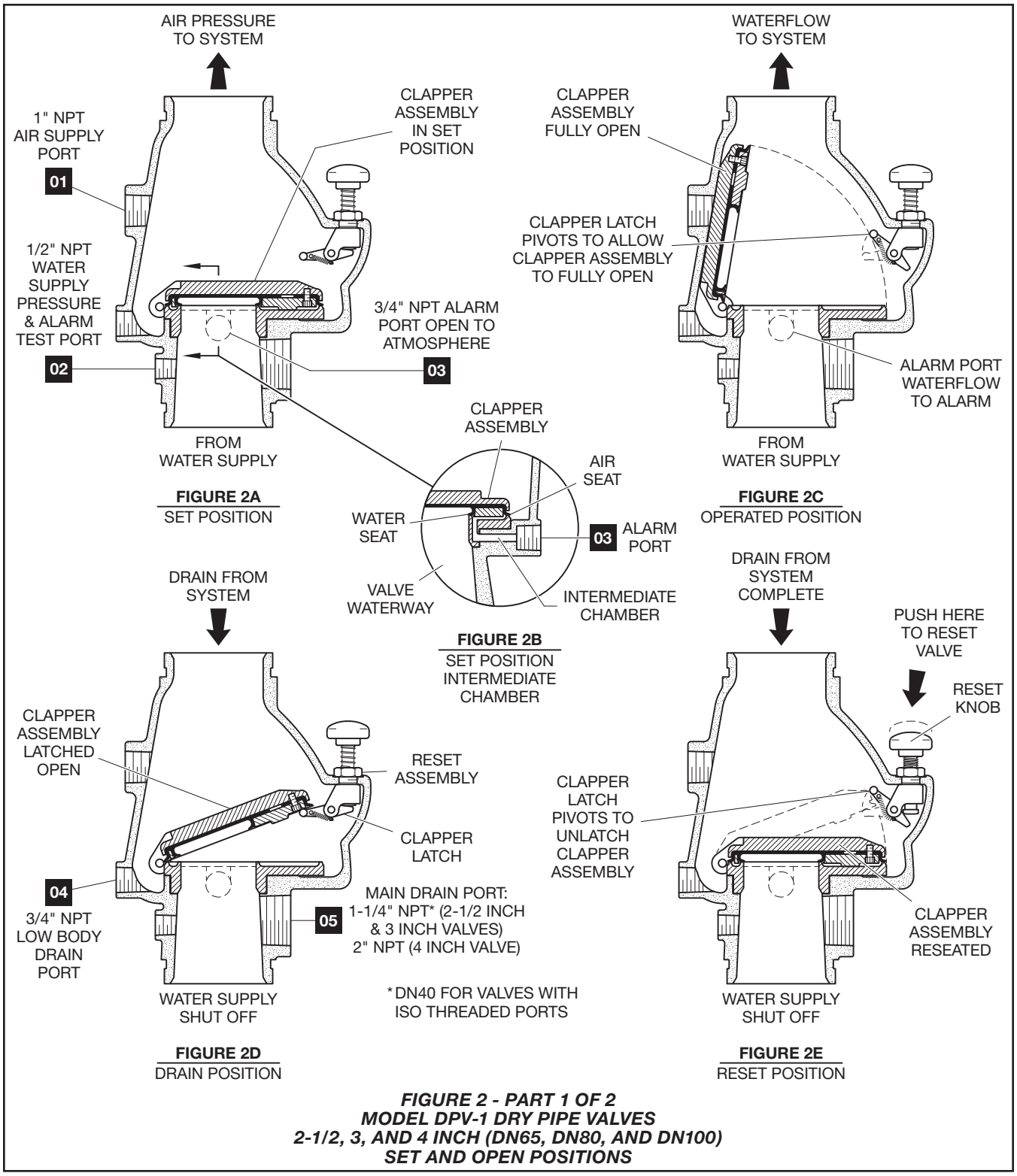


FIGURE 2 - PART 1 OF 2
MODEL DPV-1 DRY PIPE VALVES
2-1/2, 3, AND 4 INCH (DN65, DN80, AND DN100)
SET AND OPEN POSITIONS

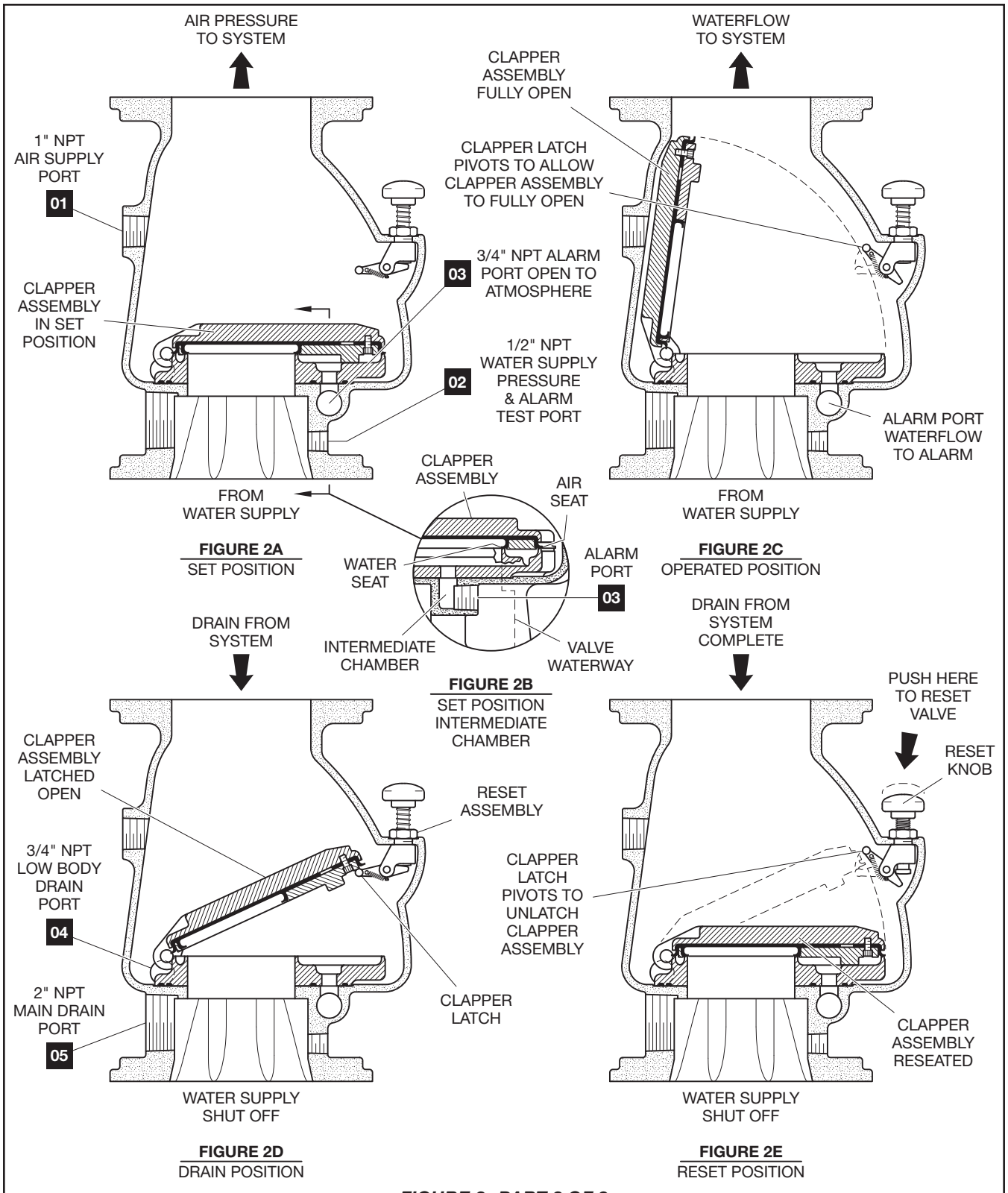


FIGURE 2- PART 2 OF 2
MODEL DPV-1 DRY PIPE VALVES
6 INCH (DN150)
SET AND OPEN POSITIONS

NOTES:

1. SEE FIGURE 3 PART 3 FOR TRIM ARRANGEMENT WITH BILL OF MATERIALS AND COMPONENT PART NUMBERS.
2. TRIM SHOWN FULLY ASSEMBLED; COMPONENTS SUCH AS GAUGES AND SWITCHES MAY REQUIRE ASSEMBLY IN TRIM AT INSTALLATION.

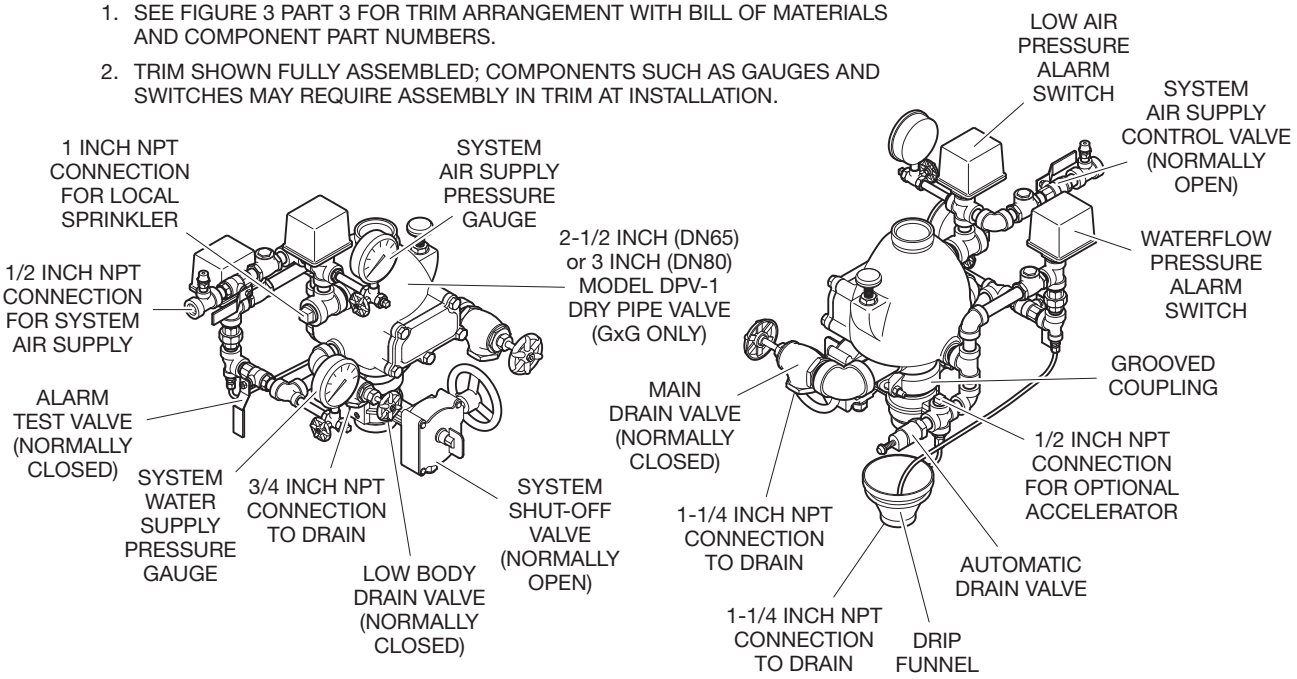


FIGURE 3 - PART 1 OF 3
2-1/2 AND 3 INCH (DN65 AND DN80) MODEL DPV-1 DRY PIPE VALVE
PRE-TRIMMED ASSEMBLY

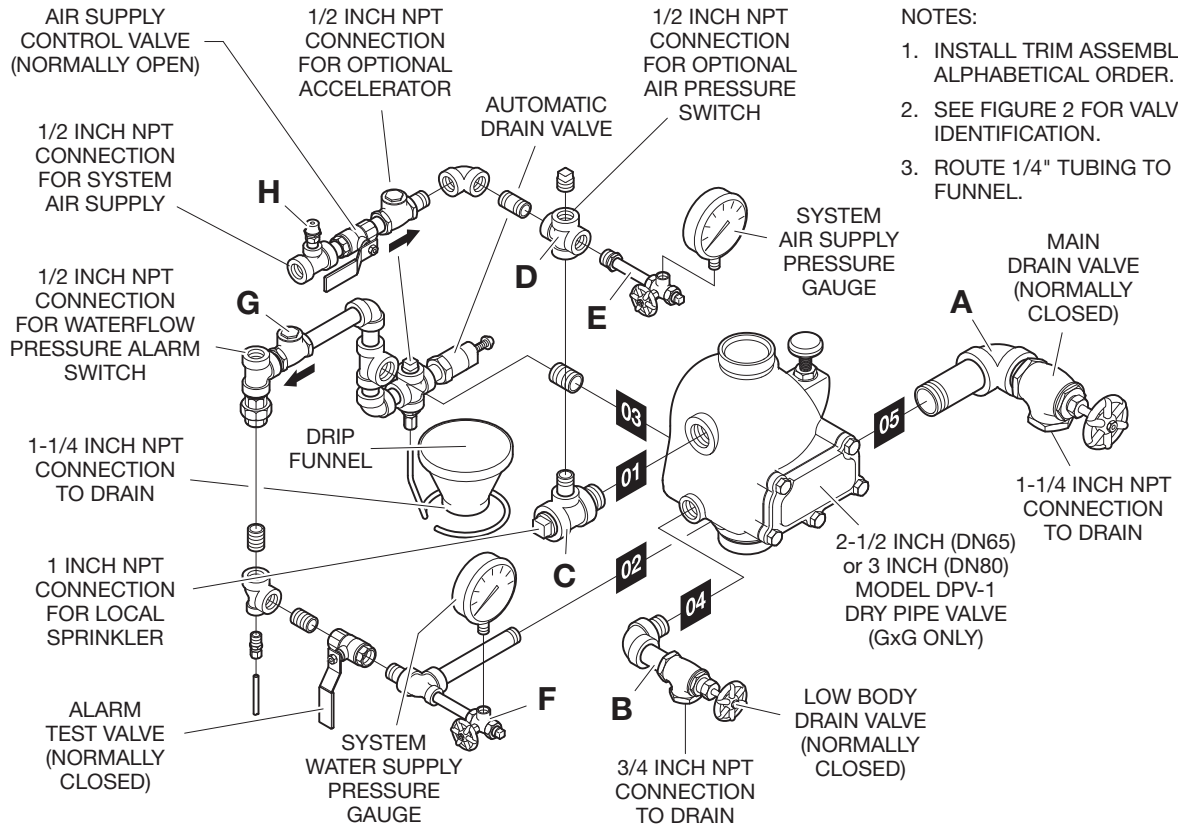
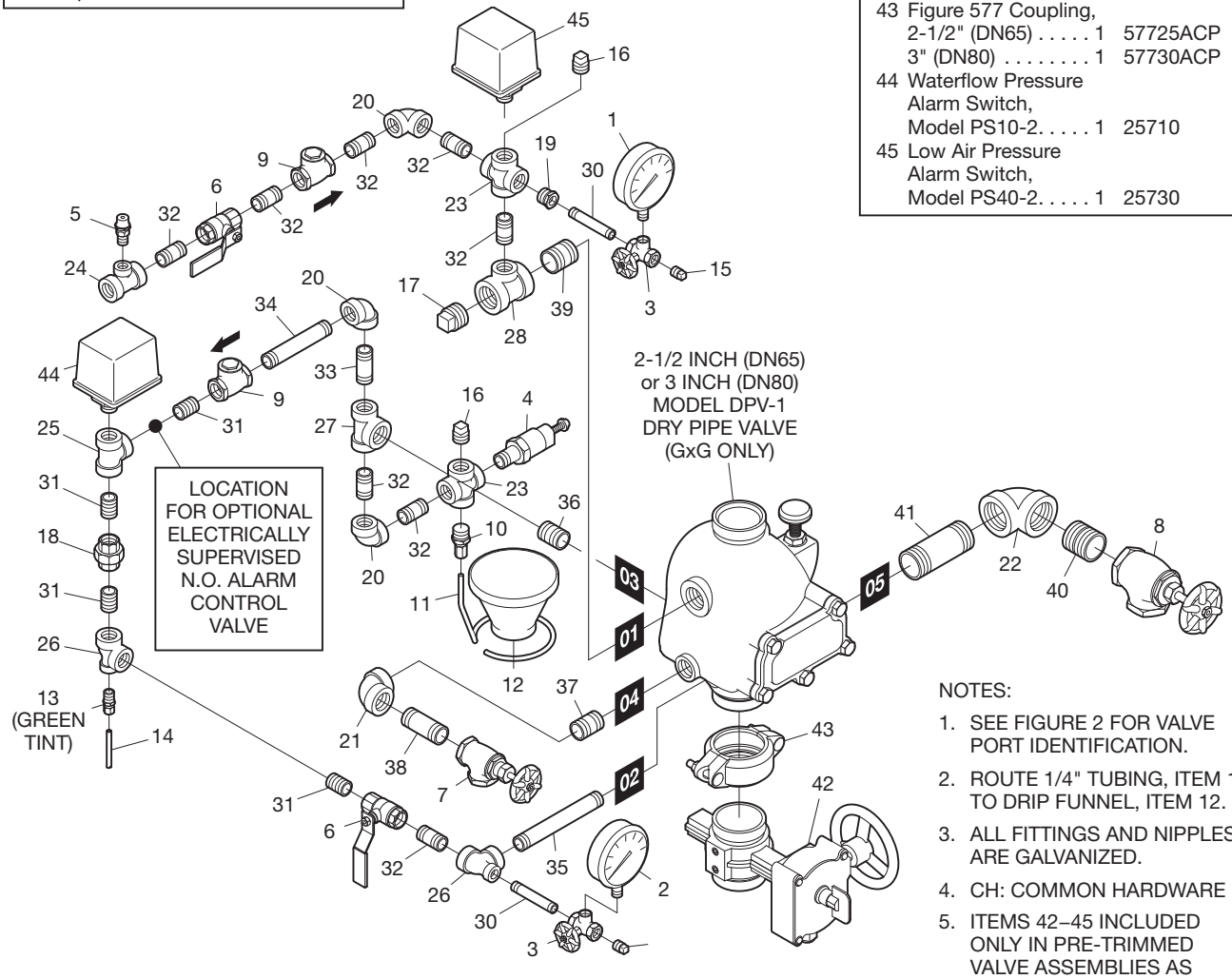


FIGURE 3 - PART 2 OF 3
2-1/2 AND 3 INCH (DN65 AND DN80) MODEL DPV-1 DRY PIPE VALVE
EXPLODED ARRANGEMENT OF SEMI-ASSEMBLED TRIM

NO.	DESCRIPTION	QTY	P/N
1	250 psi/ 1750 kPa Air Pressure Gauge	1	92-343-1-012
2	300 psi/ 2000 kPa Water Pressure Gauge	1	92-343-1-005
3	1/4" Gauge Test Valve	2	46-005-1-002
4	Model AD-1 Automatic Drain Valve	1	52-793-2-004
5	1/4" Pressure Relief Valve	1	92-343-1-020
6	1/2" Ball Valve	2	46-050-1-004
7	3/4" Angle Valve	1	46-048-1-005
8	1-1/4" Angle Valve	1	46-048-1-007
9	1/2" Swing Check Valve	2	46-049-1-004
10	Drip Funnel Connector	1	92-211-1-005
11	Drip Funnel Bracket	1	92-211-1-003
12	Drip Funnel	1	92-343-1-007
13	3/32" Vent Fitting	1	92-032-1-002
14	1/4" Tube, 18" Long	1	CH
15	1/4" Plug	2	CH
16	1/2" Plug	2	CH
17	1" Plug	1	CH
18	1/2" Union	1	CH
19	1/2" x 1/4" Reducing Bushing	1	CH
20	1/2" 90° Elbow	3	CH
21	3/4" 90° Elbow	1	CH
22	1-1/4" 90° Elbow	1	CH
23	1/2" Cross	2	CH
24	1/2" x 1/2" x 1/4" Reducing Tee	1	CH
25	1/2" Tee	1	CH
26	1/2" x 1/4" x 1/2" Reducing Tee	2	CH
27	1/2" x 1/2" x 3/4" Reducing Tee	1	CH
28	1" x 1" x 1/2" Reducing Tee	1	CH
29	Not Used		
PIPE NIPPLES:			
30	1/4" x 3"	2	CH
31	1/2" x Close	4	CH
32	1/2" x 1-1/2"	8	CH
33	1/2" x 2"	1	CH
34	1/2" x 4-1/2"	1	CH
35	1/2" x 6"	1	CH
36	3/4" x Close	1	CH
37	3/4" x 1-1/2"	1	CH
38	3/4" x 2-1/2"	1	CH
39	1" x Close	1	CH
40	1-1/4" x Close	1	CH
41	1-1/4" x 4"	1	CH

COMPONENTS INCLUDED ONLY IN PRE-TRIMMED VALVE ASSEMBLIES:

42	Model BFV-300 Butterfly Valve, 2-1/2" (DN65)	1	59300G025WS
	3" (DN80)	1	59300G030WS
43	Figure 577 Coupling, 2-1/2" (DN65)	1	57725ACP
	3" (DN80)	1	57730ACP
44	Waterflow Pressure Alarm Switch, Model PS10-2	1	25710
45	Low Air Pressure Alarm Switch, Model PS40-2	1	25730



NOTES:

1. SEE FIGURE 2 FOR VALVE PORT IDENTIFICATION.
2. ROUTE 1/4" TUBING, ITEM 14, TO DRIP FUNNEL, ITEM 12.
3. ALL FITTINGS AND NIPPLES ARE GALVANIZED.
4. CH: COMMON HARDWARE
5. ITEMS 42–45 INCLUDED ONLY IN PRE-TRIMMED VALVE ASSEMBLIES AS APPLICABLE; OTHERWISE SEPARATELY ORDERED.

FIGURE 3 - PART 3 OF 3
2-1/2 AND 3 INCH (DN65 AND DN80) MODEL DPV-1 DRY PIPE VALVE
EXPLODED ARRANGEMENT OF VALVE TRIM

1. SEE FIGURE 4 PART 3 FOR TRIM ARRANGEMENT WITH BILL OF MATERIALS AND COMPONENT PART NUMBERS.
2. TRIM SHOWN FULLY ASSEMBLED; COMPONENTS SUCH AS GAUGES AND SWITCHES MAY REQUIRE ASSEMBLY IN TRIM AT INSTALLATION.

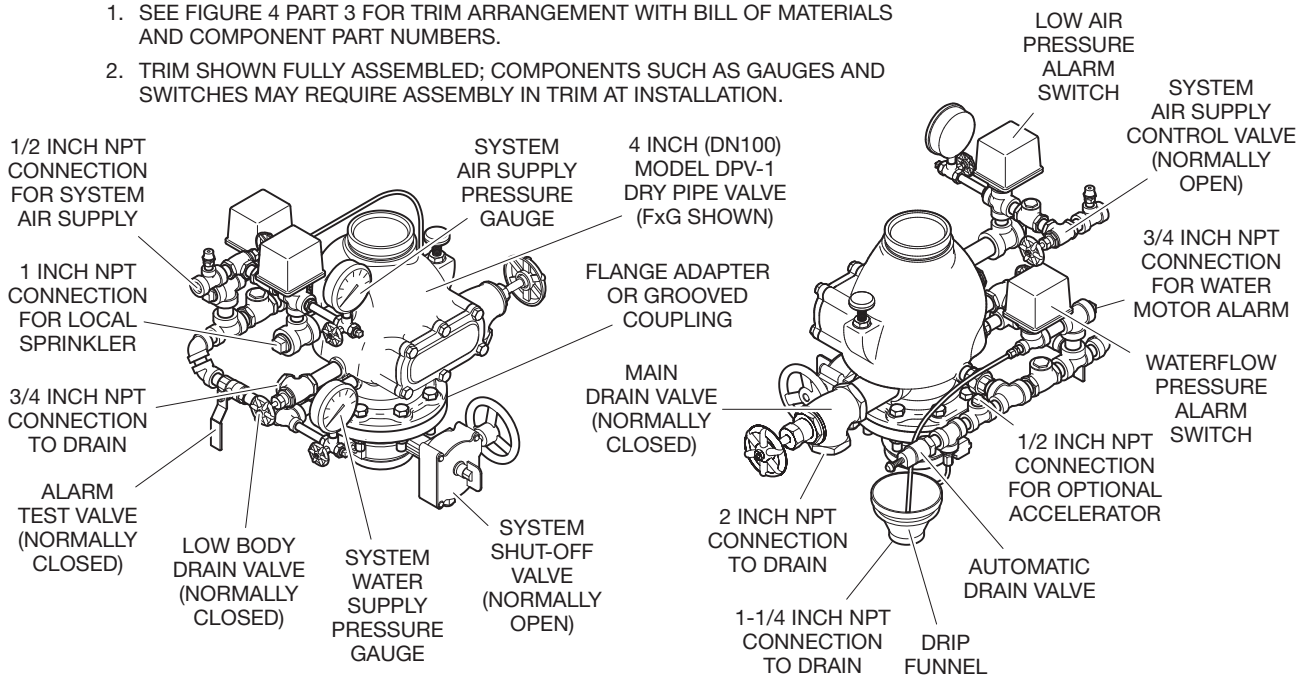
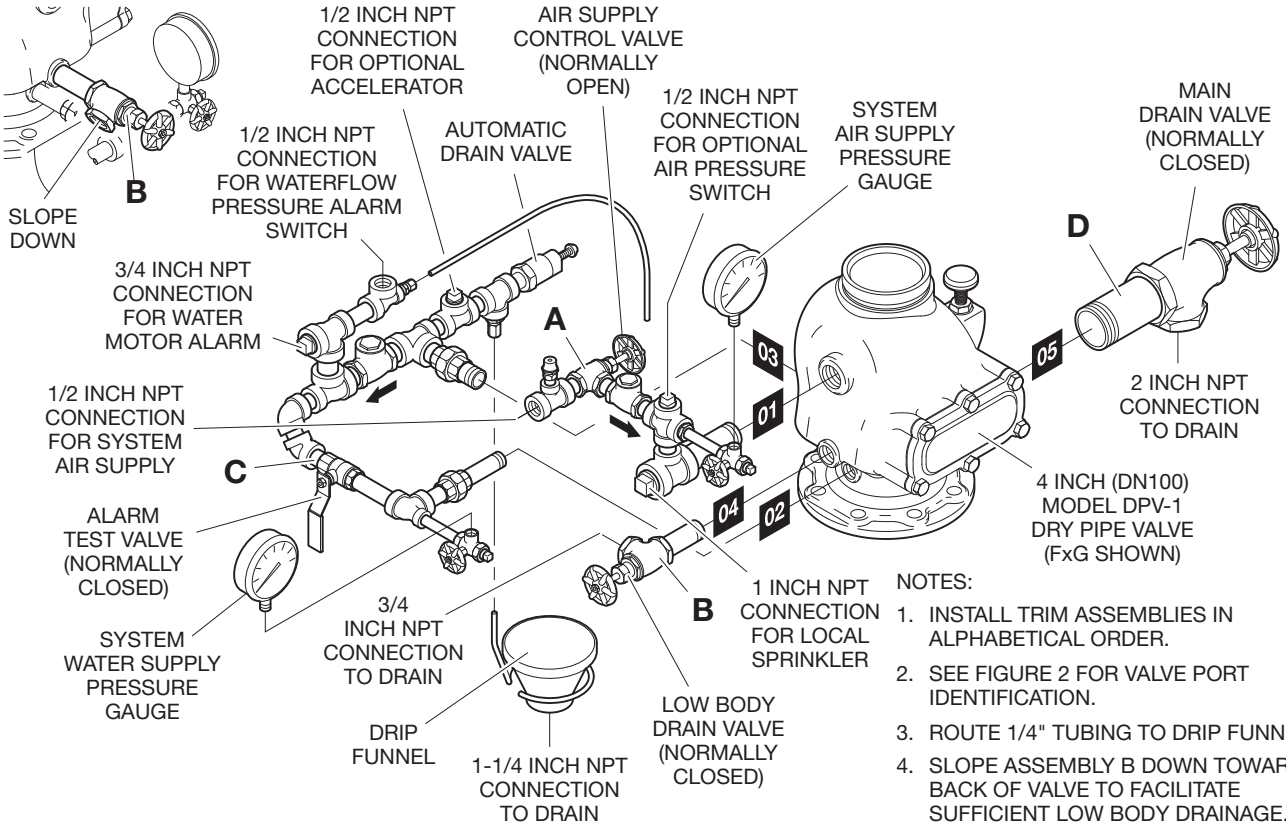
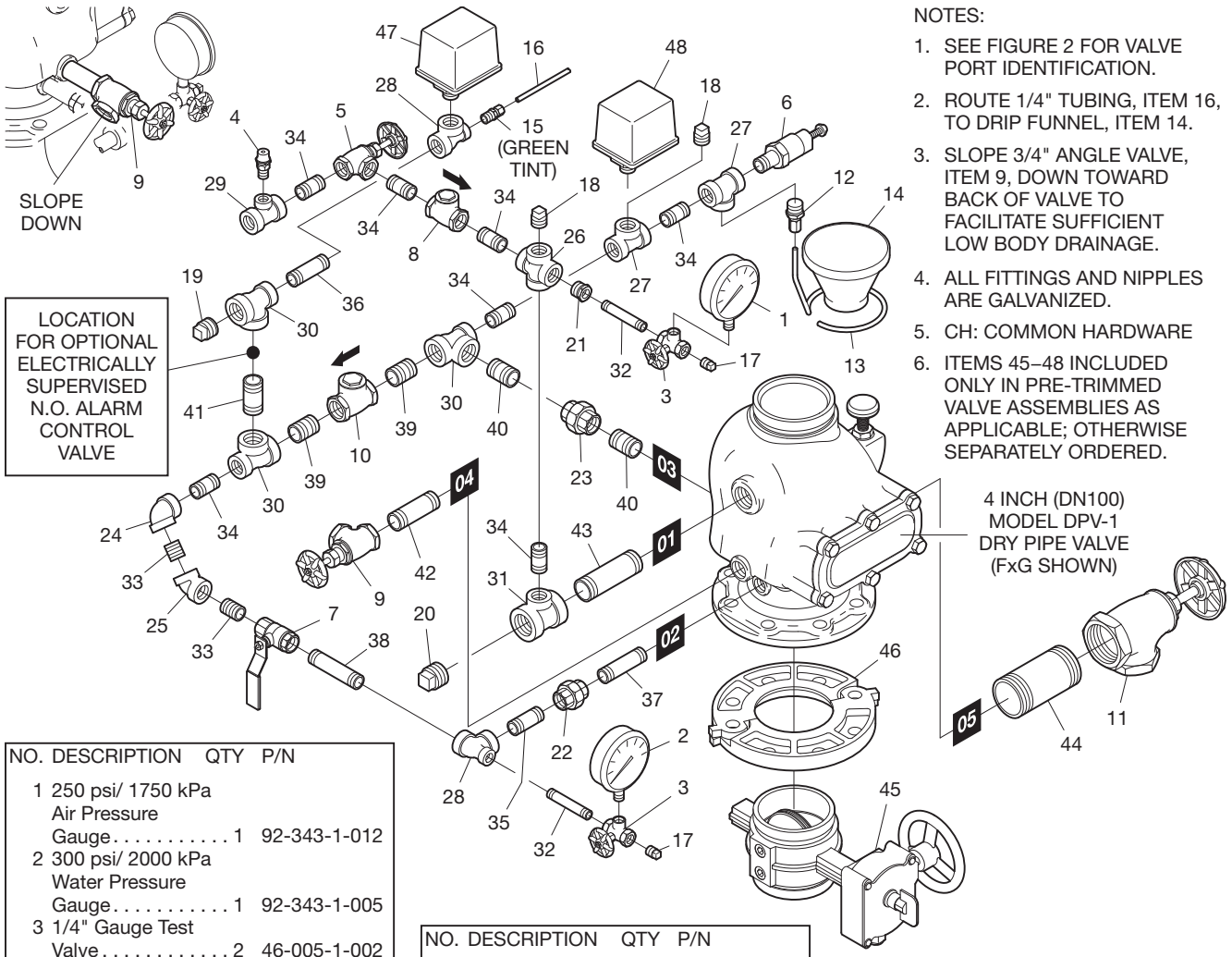


FIGURE 4 - PART 1 OF 3
4 INCH (DN100) MODEL DPV-1 DRY PIPE VALVE
PRE-TRIMMED ASSEMBLY



NOTES:
1. INSTALL TRIM ASSEMBLIES IN ALPHABETICAL ORDER.
2. SEE FIGURE 2 FOR VALVE PORT IDENTIFICATION.
3. ROUTE 1/4" TUBING TO DRIP FUNNEL.
4. SLOPE ASSEMBLY B DOWN TOWARD BACK OF VALVE TO FACILITATE SUFFICIENT LOW BODY DRAINAGE.

FIGURE 4 - PART 2 OF 3
4 INCH (DN100) MODEL DPV-1 DRY PIPE VALVE
EXPLODED ARRANGEMENT OF SEMI-ASSEMBLED TRIM



NOTES:

1. SEE FIGURE 2 FOR VALVE PORT IDENTIFICATION.
2. ROUTE 1/4" TUBING, ITEM 16, TO DRIP FUNNEL, ITEM 14.
3. SLOPE 3/4" ANGLE VALVE, ITEM 9, DOWN TOWARD BACK OF VALVE TO FACILITATE SUFFICIENT LOW BODY DRAINAGE.
4. ALL FITTINGS AND NIPPLES ARE GALVANIZED.
5. CH: COMMON HARDWARE
6. ITEMS 45–48 INCLUDED ONLY IN PRE-TRIMMED VALVE ASSEMBLIES AS APPLICABLE; OTHERWISE SEPARATELY ORDERED.

NO.	DESCRIPTION	QTY	P/N
1	250 psi/ 1750 kPa Air Pressure Gauge	1	92-343-1-012
2	300 psi/ 2000 kPa Water Pressure Gauge	1	92-343-1-005
3	1/4" Gauge Test Valve	2	46-005-1-002
4	1/4" Pressure Relief Valve	1	92-343-1-020
5	1/2" Angle Valve	1	46-048-1-004
6	Model AD-1 Automatic Drain Valve	1	52-793-2-004
7	1/2" Ball Valve	1	46-050-1-004
8	1/2" Swing Check Valve	1	46-049-1-004
9	3/4" Angle Valve	1	46-048-1-005
10	3/4" Swing Check Valve	1	46-049-1-005
11	2" Angle Valve	1	46-048-1-009
12	Drip Funnel Connector	1	92-211-1-005
13	Drip Funnel Bracket	1	92-211-1-003
14	Drip Funnel	1	92-343-1-007
15	3/32" Vent Fitting	1	92-032-1-002
16	1/4" Tube, 24" Long	1	CH
17	1/4" Plug	2	CH
18	1/2" Plug	2	CH
19	3/4" Plug	1	CH
20	1" Plug	1	CH

NO.	DESCRIPTION	QTY	P/N
21	1/2" x 1/4" Reducing Bushing	1	CH
22	1/2" Union	1	CH
23	3/4" Union	1	CH
24	1/2" 90° Elbow	1	CH
25	1/2" 45° Elbow	1	CH
26	1/2" Cross	1	CH
27	1/2" Tee	2	CH
28	1/2" x 1/4" x 1/2" Reducing Tee	2	CH
29	1/2" x 1/2" x 1/4" Reducing Tee	1	CH
30	3/4" x 1/2" x 3/4" Reducing Tee	3	CH
31	1" x 1" x 1/2" Reducing Tee	1	CH
PIPE NIPPLES:			
32	1/4" x 3"	2	CH
33	1/2" x Close	2	CH
34	1/2" x 1-1/2"	7	CH
35	1/2" x 2"	1	CH
36	1/2" x 2-1/2"	1	CH
37	1/2" x 3"	1	CH
38	1/2" x 3-1/2"	1	CH
39	3/4" x Close	2	CH
40	3/4" x 1-1/2"	2	CH

NO.	DESCRIPTION	QTY	P/N
41	3/4" x 2"	1	CH
42	3/4" x 3"	1	CH
43	1" x 4"	1	CH
44	2" x 4-1/2"	1	CH

COMPONENTS INCLUDED ONLY IN PRE-TRIMMED VALVE ASSEMBLIES:

NO.	DESCRIPTION	QTY	P/N
45	Model BFV-300 Butterfly Valve, 4" (DN100)	1	59300G040WS
46	Butterfly Valve Assembly Component: GxG DPV-1 Valves, Figure 577 Coupling, 4" (DN100)	1	57740ACP
	FxF, FxG DPV-1 Valves, Figure 71 Flange Adapter, 4" (DN100)	1	7140S
47	Waterflow Pressure Alarm Switch, Model PS10-2	1	25710
48	Low Air Pressure Alarm Switch, Model PS40-2	1	25730

FIGURE 4 - PART 3 OF 3
4 INCH (DN100) MODEL DPV-1 DRY PIPE VALVE
EXPLODED ARRANGEMENT OF VALVE TRIM

NOTES:

1. SEE FIGURE 5 PART 3 FOR TRIM ARRANGEMENT WITH BILL OF MATERIALS AND COMPONENT PART NUMBERS.
2. TRIM SHOWN FULLY ASSEMBLED; COMPONENTS SUCH AS GAUGES AND SWITCHES MAY REQUIRE ASSEMBLY IN TRIM AT INSTALLATION.

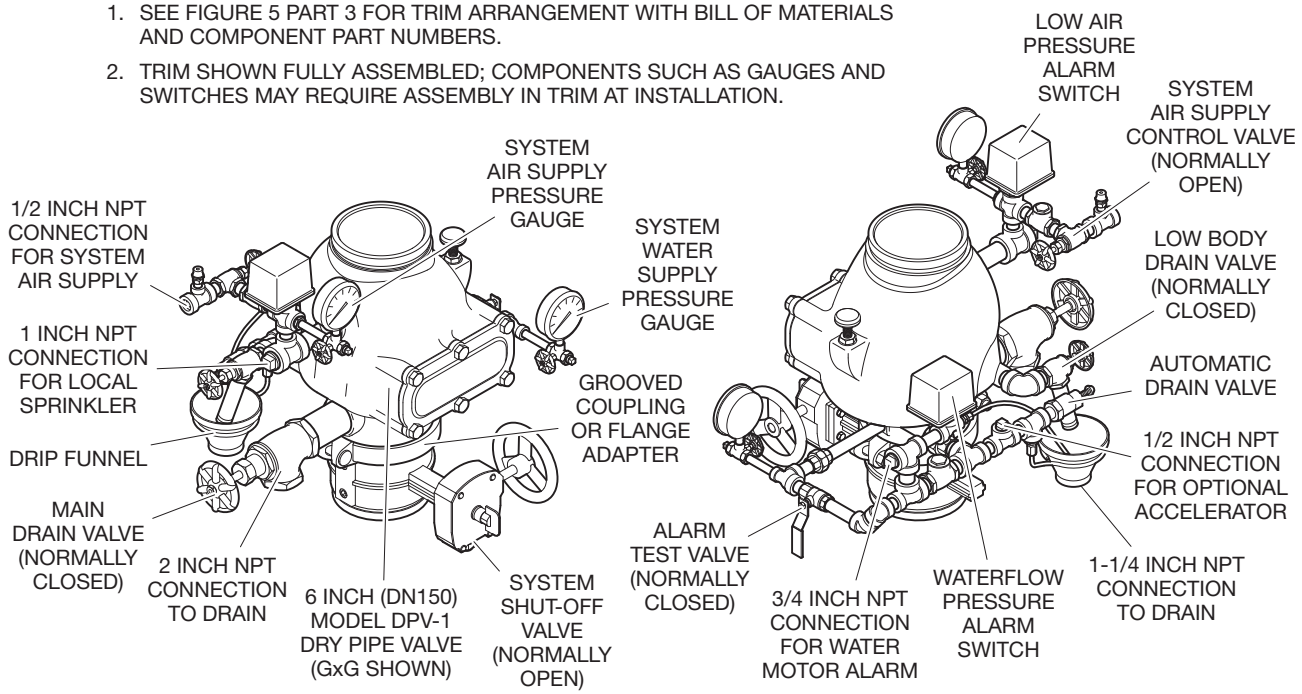
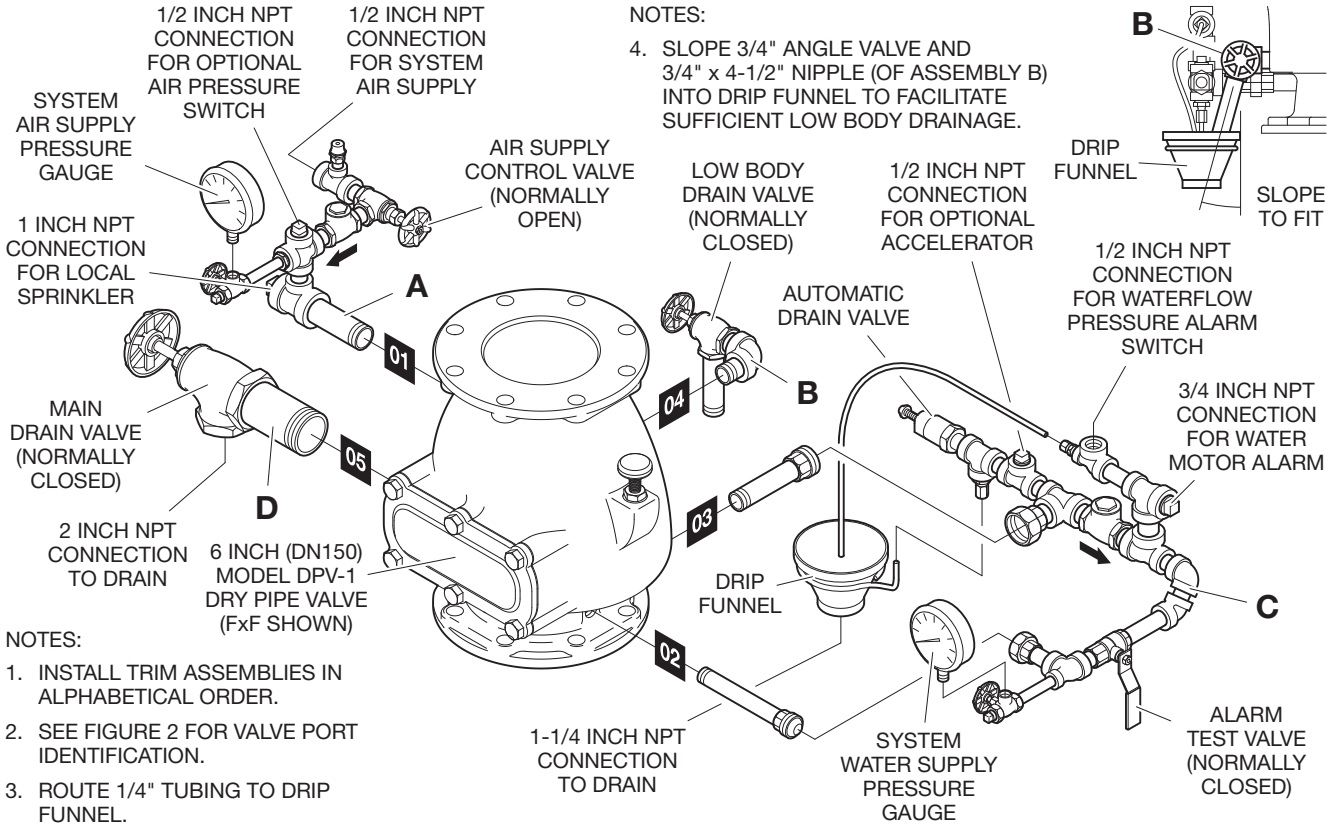


FIGURE 5 - PART 1 OF 3
6 INCH (DN150) MODEL DPV-1 DRY PIPE VALVE
PRE-TRIMMED ASSEMBLY



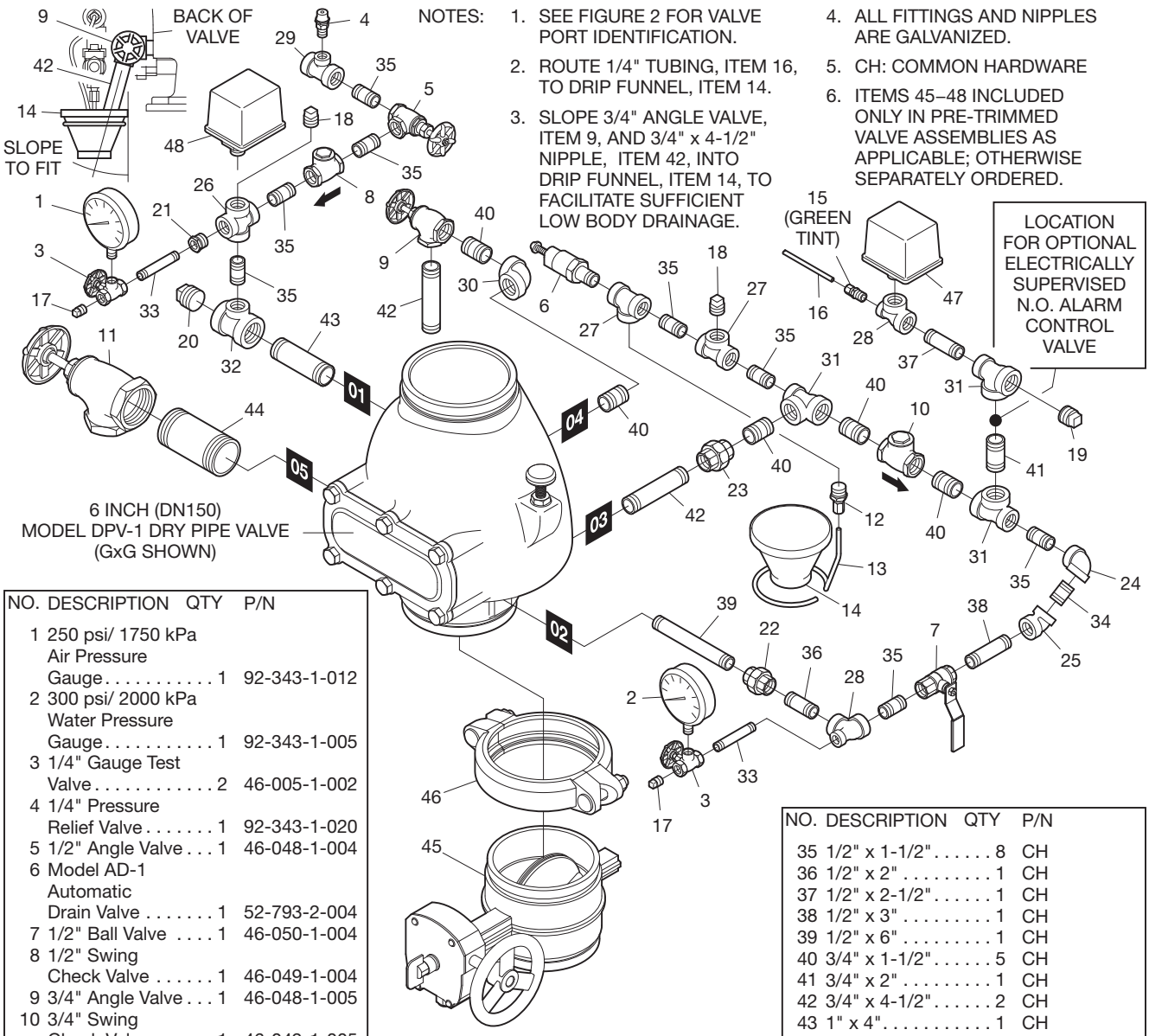
NOTES:

4. SLOPE 3/4" ANGLE VALVE AND 3/4" x 4-1/2" NIPPLE (OF ASSEMBLY B) INTO DRIP FUNNEL TO FACILITATE SUFFICIENT LOW BODY DRAINAGE.

NOTES:

1. INSTALL TRIM ASSEMBLIES IN ALPHABETICAL ORDER.
2. SEE FIGURE 2 FOR VALVE PORT IDENTIFICATION.
3. ROUTE 1/4" TUBING TO DRIP FUNNEL.

FIGURE 5 - PART 2 OF 3
6 INCH (DN150) MODEL DPV-1 DRY PIPE VALVE
EXPLODED ARRANGEMENT OF SEMI-ASSEMBLED TRIM



NOTES:

1. SEE FIGURE 2 FOR VALVE PORT IDENTIFICATION.
2. ROUTE 1/4" TUBING, ITEM 16, TO DRIP FUNNEL, ITEM 14.
3. SLOPE 3/4" ANGLE VALVE, ITEM 9, AND 3/4" x 4-1/2" NIPPLE, ITEM 42, INTO DRIP FUNNEL, ITEM 14, TO FACILITATE SUFFICIENT LOW BODY DRAINAGE.
4. ALL FITTINGS AND NIPPLES ARE GALVANIZED.
5. CH: COMMON HARDWARE
6. ITEMS 45–48 INCLUDED ONLY IN PRE-TRIMMED VALVE ASSEMBLIES AS APPLICABLE; OTHERWISE SEPARATELY ORDERED.

NO.	DESCRIPTION	QTY	P/N
1	250 psi/ 1750 kPa Air Pressure Gauge	1	92-343-1-012
2	300 psi/ 2000 kPa Water Pressure Gauge	1	92-343-1-005
3	1/4" Gauge Test Valve	2	46-005-1-002
4	1/4" Pressure Relief Valve	1	92-343-1-020
5	1/2" Angle Valve	1	46-048-1-004
6	Model AD-1 Automatic Drain Valve	1	52-793-2-004
7	1/2" Ball Valve	1	46-050-1-004
8	1/2" Swing Check Valve	1	46-049-1-004
9	3/4" Angle Valve	1	46-048-1-005
10	3/4" Swing Check Valve	1	46-049-1-005
11	2" Angle Valve	1	46-048-1-009
12	Drip Funnel Connector	1	92-211-1-005
13	Drip Funnel Bracket	1	92-211-1-003
14	Drip Funnel	1	92-343-1-007
15	3/32" Vent Fitting	1	92-032-1-002
16	1/4" Tube, 24" Long	1	CH
17	1/4" Plug	2	CH
18	1/2" Plug	2	CH
19	3/4" Plug	1	CH
20	1" Plug	1	CH
21	1/2" x 1/4" Reducing Bushing	1	CH
22	1/2" Union	1	CH
23	3/4" Union	1	CH
24	1/2" 90° Elbow	1	CH

NO.	DESCRIPTION	QTY	P/N
25	1/2" 45° Elbow	1	CH
26	1/2" Cross	1	CH
27	1/2" Tee	2	CH
28	1/2" x 1/4" x 1/2" Reducing Tee	2	CH
29	1/2" x 1/2" x 1/4" Reducing Tee	1	CH
30	3/4" 90° Elbow	1	CH
31	3/4" x 1/2" x 3/4" Reducing Tee	3	CH
32	1" x 1" x 1/2" Reducing Tee	1	CH
PIPE NIPPLES:			
33	1/4" x 3"	2	CH
34	1/2" x Close	1	CH

NO.	DESCRIPTION	QTY	P/N
35	1/2" x 1-1/2"	8	CH
36	1/2" x 2"	1	CH
37	1/2" x 2-1/2"	1	CH
38	1/2" x 3"	1	CH
39	1/2" x 6"	1	CH
40	3/4" x 1-1/2"	5	CH
41	3/4" x 2"	1	CH
42	3/4" x 4-1/2"	2	CH
43	1" x 4"	1	CH
44	2" x 4-1/2"	1	CH

COMPONENTS INCLUDED ONLY IN PRE-TRIMMED VALVE ASSEMBLIES:

NO.	DESCRIPTION	QTY	P/N
45	Model BFV-300 Butterfly Valve, 6" (DN150)	1	59300G060WS
46	Butterfy Valve Assembly Component: GxG DPV-1 Valves, Figure 577 Coupling, 6" (DN150)	1	57760ACP
	FxF, FxG DPV-1 Valves, Figure 71 Flange Adapter, 6" (DN150)	1	7160S
47	Waterflow Pressure Alarm Switch, Model PS10-2	1	25710
48	Low Air Pressure Alarm Switch, Model PS40-2	1	25730

FIGURE 5 - PART 3 OF 3
6 INCH (DN150) MODEL DPV-1 DRY PIPE VALVE
EXPLODED ARRANGEMENT OF VALVE TRIM

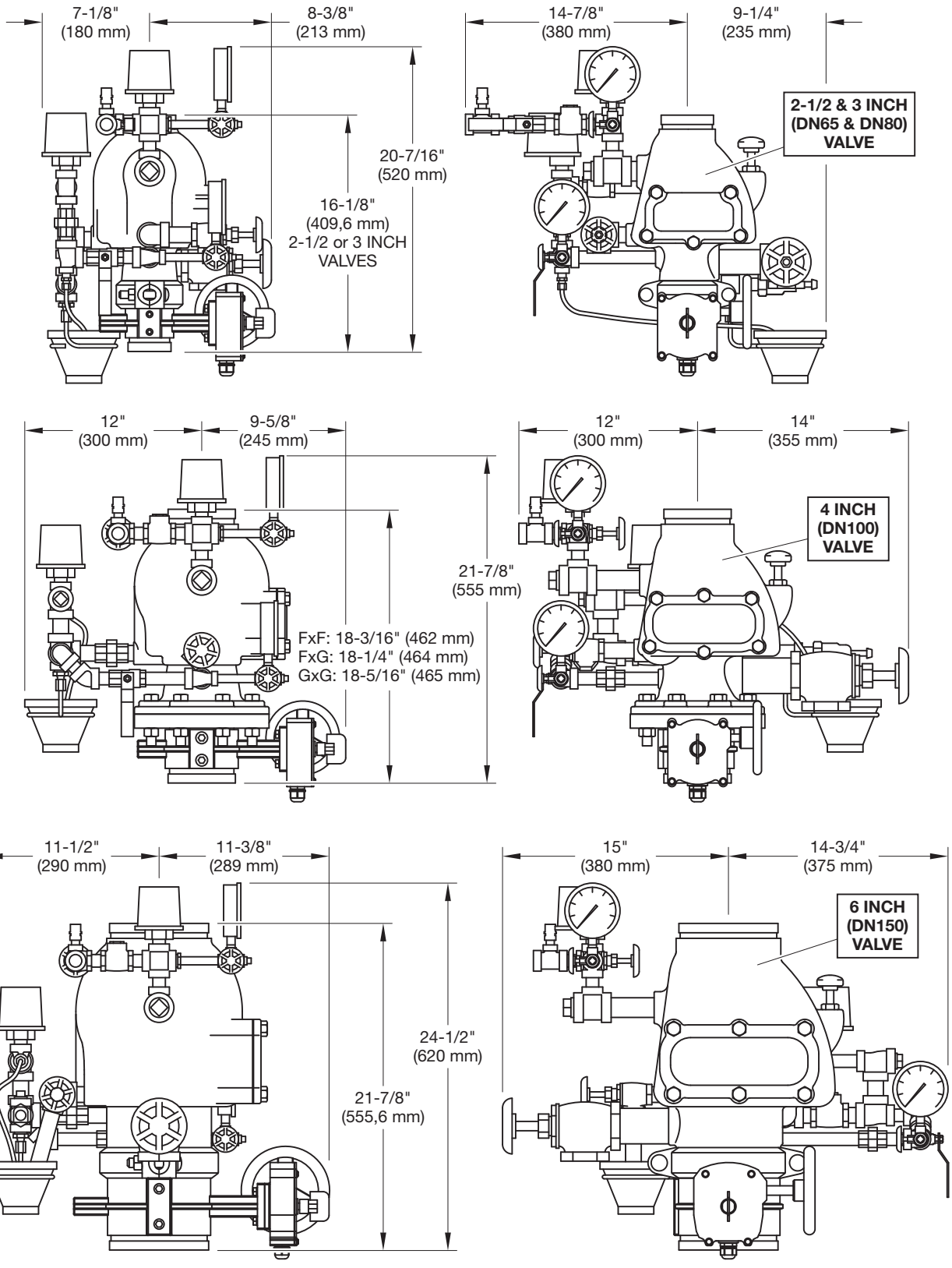


FIGURE 6 - PART 1 OF 2
MODEL DPV-1 DRY PIPE VALVE
INSTALLATION DIMENSIONS, PRE-TRIMMED VALVE

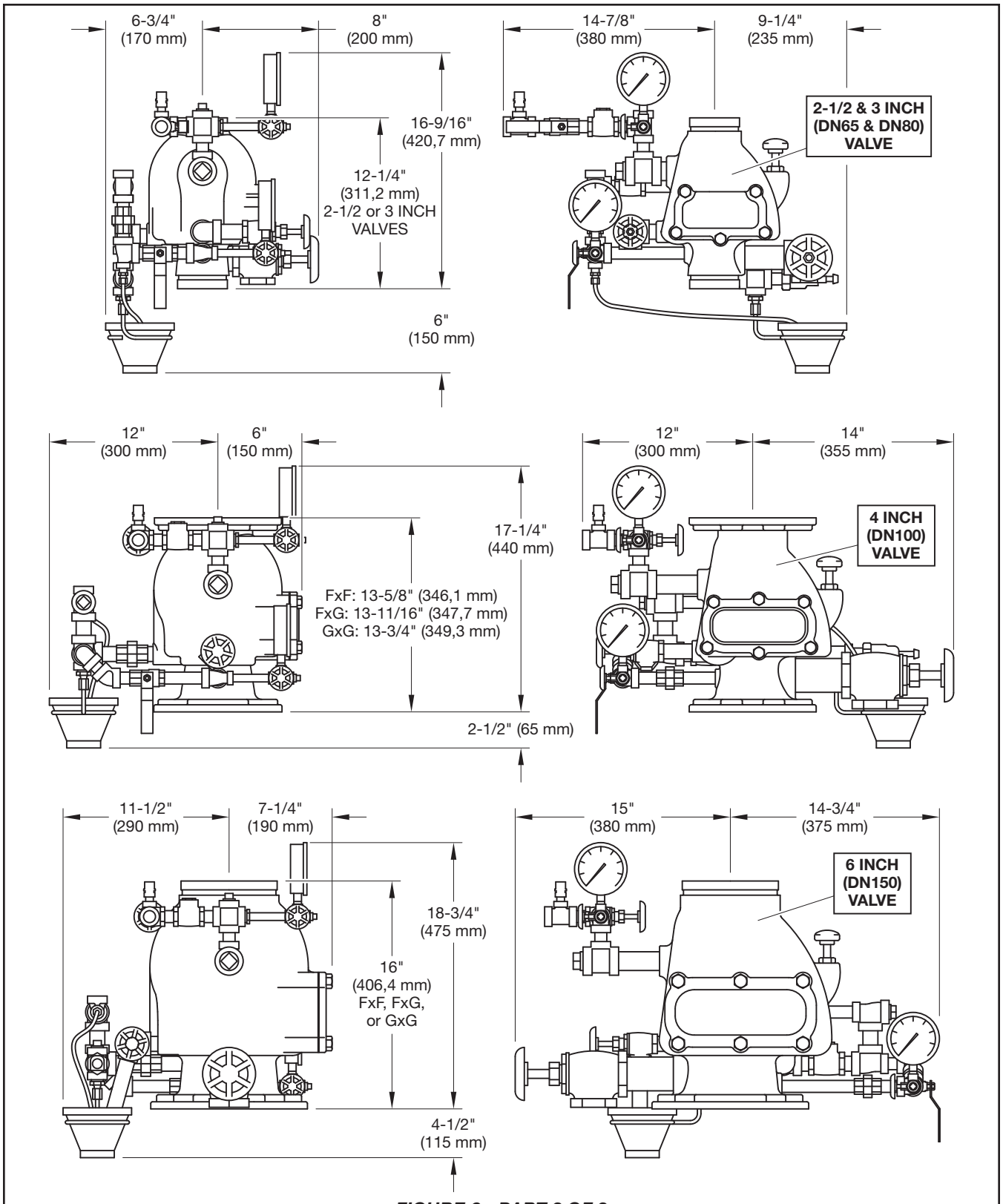


FIGURE 6 - PART 2 OF 2
MODEL DPV-1 DRY PIPE VALVE
INSTALLATION DIMENSIONS, VALVE AND SEMI-ASSEMBLED TRIM

Care and Maintenance

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

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

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. Contact the installing contractor or sprinkler manufacturer regarding any questions.

Automatic sprinkler systems are recommended to be inspected, tested, and maintained by a qualified Inspection Service in accordance with local requirements and/or national codes.

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

Annual Operation Test Procedure
Note: *Unless otherwise noted, refer to Figure 3, 4, or 5 to identify functional trim components.*

Proper operation of the DPV-1 Valve (i.e., opening of the DPV-1 Valve during a fire condition) should be verified at least once a year as follows:

Step 1. If necessary, prevent water from flowing beyond the riser by:

- Close the Main Control Valve
- Open the Main Drain Valve
- Open the Main Control Valve one turn beyond the position at which water just begins to flow from the Main Drain Valve
- Close the Main Drain Valve

Step 2. Open the system Inspector's Test Connection.

Step 3. Verify that the DPV-1 Valve has operated, as indicated by the flow of water into the system and that all waterflow alarms operate properly.

Step 4. Close the system Main Control Valve.

Step 5. Reset the DPV-1 Valve in accordance with the Valve Setting Procedure.

Note: *It is recommended that the requirement of NFPA 25 to annually inspect the inside of the valve be performed at this time and prior to resetting the DPV-1 Valve. Refer to the Automatic Drain Valve Inspection subsection Steps 2 through 5 for instructions with regard to the inspection of the Clapper Facing.*

Quarterly Waterflow Alarm Test Procedure
Testing of the system waterflow alarms should be performed quarterly. To test the waterflow alarm, open the Alarm Test Valve, which will allow a flow of water to the Waterflow Pressure Alarm Switch and/or Water Motor Alarm. Upon satisfactory completion of the test, close the Alarm Test Valve.

Water Pressure Inspection
The Water Pressure Gauge is to be inspected monthly (per NFPA 25) to ensure that normal system water pressure is being maintained.

Air Pressure Inspection
The Air Pressure Gauge is to be inspected monthly (per NFPA 25) to ensure that normal system air pressure is being maintained.

Automatic Drain Valve Inspection
The Automatic Drain Valve should be inspected monthly (per NFPA 25) by depressing the plunger and checking to ensure that the Automatic Drain Valve is not discharging water and/or air. A discharge of water and/or air is an indication that the air and/or water seats are leaking, which could subsequently cause a false operation should the intermediate chamber become inadvertently pressurized.

If leakage is present, take the DPV-1 Valve out of service (i.e., close the main control valve, open the main drain valve, close the air supply control valve, remove the Dry Pipe Valve Accelerator from service, as applicable, in accordance with its Technical Data Sheet (Refer to TFP1105 for the VIZOR or TFP1112 for the ACC-1), and open the Inspector's Test Connection to relieve the system air pressure to 0 psig as indicated on the System Air Pressure Gauge), and then after removing the Handhole Cover, perform the following steps:

Nominal Valve Sizes Inches (DN)	Torque Feet Lbs. (Nm)
2-1/2 (DN65)	30 (41)
3 (DN80)	30 (41)
4 (DN100)	30 (41)
6 (DN150)	55 (75)

TABLE C
HANDHOLE COVER BOLTS MAXIMUM TORQUE

Step 1. Make sure that the Seat Ring is clean and free of any nicks or significant scratches.

Step 2. Remove the Clapper Assembly from the valve by first pulling out the Hinge Pin.

Step 3. Disassemble the Clapper Facing Retainer from the Clapper so that the Clapper Facing can be removed and inspected. Make sure that the Clapper Facing does not show signs of compression set, damage, etc. Replace the Clapper Facing if there is any signs of wear.

Step 4. Clean the Clapper Facing, Clapper, and Clapper Facing Retainer, and then reassemble the Clapper Assembly.

Step 5. Reinstall the Clapper Assembly with its Hinge Pin.

Step 6. Install Handhole Cover:

a. Align Handhole Cover Gasket and Handhole Cover in proper orientation with valve body (Ref. Figure 1) and hold in place

b. Apply LOCTITE No. 242 (or equivalent) to Hex Bolt threads

c. Insert Hex Bolts through Handhole Cover Gasket and Handhole Cover, hand-tighten into valve body

d. Using crossdraw sequence to assure uniformity, wrench-tighten Hex Bolts to appropriate torque values (Ref. Table C)

e. Inspect to assure all Hex Bolts are securely tightened

Limited Warranty

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

Ordering Procedure

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

Standard DPV-1 Dry Pipe Valve
ANSI standard outside diameter (O.D.) pipe size with grooved or ANSI drilled flange end connections and NPT threaded ports.

Specify: (specify size) Model DPV-1 Dry Pipe Valve with (specify) End Connections, P/N (specify):

Groove x Groove,
ANSI 2.88 Inch (73,1 mm) O.D. Grooves:
2-1/2 Inch (DN65) G x G 52-310-1-925
Groove x Groove,
ANSI 3.50 Inch (88,9 mm) O.D. Grooves:
3 Inch (DN80) G x G. 52-310-1-930
Groove x Groove,
ANSI 4.50 Inch (114,3 mm) O.D. Grooves:
4 Inch (DN100) G x G. 52-310-1-940
Flange x Groove,
ANSI Flange x ANSI 4.50 Inch (114,3 mm) O.D. Groove:
4 Inch (DN100) F x G 52-310-1-440
Flange x Flange,
ANSI Flanges:
4 Inch (DN100) F x F 52-310-1-040
Groove xGroove,
ANSI 6.62 Inch (168,3 mm) O.D. Grooves:
6 Inch (DN150) G x G. 52-310-1-960
Flange x Groove,
ANSI Flange x ANSI 6.62 Inch (168,3 mm) O.D. Groove:
6 Inch (DN150) F x G 52-310-1-460
Flange x Flange,
ANSI Flanges:
6 Inch (DN150) F x F 52-310-1-060

Pre-Trimmed DPV-1 Assemblies with Butterfly Valve
Specify: 2-1/2 Inch DPV-1 Pre-Trimmed Valve Assembly, Grooved End Connections, P/N 52-310-3-925

Specify: 3 Inch DPV-1 Pre-Trimmed Valve Assembly, Grooved End Connections, P/N 52-310-3-930

Specify: 4 Inch DPV-1 Pre-Trimmed Valve Assembly, (specify) End Connection, P/N (specify):

Flange x Flange 52-310-3-040
Flange x Groove. 52-310-3-440
Groove x Groove 52-310-3-940

Specify: 6 Inch DPV-1 Pre-Trimmed Valve Assembly, (specify) End Connection, P/N (specify):

Flange x Flange 52-310-3-060
Flange x Groove. 52-310-3-460
Groove x Groove 52-310-3-960

Pre-Trimmed DPV-1 Assemblies without Butterfly Valve
Specify: 4 Inch DVP-1 Pre-Trimmed Valve Assembly without Butterfly, (specify) End Connection, P/N (specify):

Flange x Flange 52-310-4-040
Flange x Groove. 52-310-4-440

Specify: 6 Inch DVP-1 Pre-Trimmed Valve Assembly without Butterfly, (specify) End Connection, P/N (specify):

Flange x Flange 52-310-4-060
Flange x Groove. 52-310-4-460

Standard Galvanized Semi-Assembled DPV-1 Trim
Note: *Valves with NPT threaded ports are intended for use with the Standard Galvanized Semi-Assembled DPV-1 Valve Trim described in Figures 3, 4 and 5 of this document.*

Specify: 2-1/2 and 3 Inch DPV-1 Semi-Assembled Galvanized Trim, P/N 52-309-2-005

Specify: 4 Inch DPV-1 Semi-Assembled Galvanized Trim, P/N 52-309-2-001

Specify: 6 Inch DPV-1 Semi-Assembled Galvanized Trim, P/N 52-309-2-002

Optional Electronic Accelerator: VIZOR Electronic Dry Pipe Accelerator (with Trim)
(Ref. Technical Data Sheet TFP1105)

Specify: VIZOR Electronic Dry Pipe Accelerator for use with the 4 or 6 inch TYCO Model DPV-1 Dry Pipe Valve Trim, P/N 52-312-3-001

Optional Mechanical Accelerator: Model ACC-1 Dry Pipe Accelerator
(Ref. Technical Data Sheet TFP1112)

Specify: Model ACC-1 Dry Pipe Accelerator, P/N 52-311-1-001, and Galvanized Accelerator Trim for Model DPV-1 Dry Pipe Valve, P/N 52-311-2-010

Optional 600 PSI Water Pressure Gauge:
Specify: 600 PSI Water Pressure Gauge, P/N 92-343-1-004

Accessories
Refer to Technical data Sheets describing the following accessories, as applicable.

Specify: Description, P/N (specify):

Model PS10-2 Potter Electric Waterflow
Pressure Alarm Switch 25710
(Ref. Potter Electric Technical Data Sheet)
Model PS40-2 Potter Electric Low Air
Pressure Alarm Switch 25730
(Ref. Potter Electric Technical Data Sheet)
Model WMA-1
Water Motor Alarm. 52-630-1-001
(Ref. Technical Data Sheet TFP921)
Model AMD-1
Air Maintenance Device. 52-324-2-002
(Ref. Technical Data Sheet TFP1221)
Model AMD-2
Air Maintenance Device. 52-326-2-001
(Ref. Technical Data Sheet TFP1231)
Model AMD-3
Nitrogen Maintenance Device 52-328-2-001
(Ref. Technical Data Sheet TFP1241)

Replacement Valve Parts
Specify: (description) for use with (specify size) Model DPV-1 Dry Pipe Valve, P/N (see Figure 1).

Replacement Trim Parts
Specify: (description) for use with (specify size) Model DPV-1 Dry Pipe Valve, P/N (see Figures 3, 4, or 5).

Other DPV-1 Dry Pipe Valves
Notes: *Other DPV-1 Dry Pipe Valves are valves ordered with any combination of flange drilling, pipe groove outside diameter (O.D.), or port thread specification not offered as Standard DPV-1 Dry Pipe Valves.*

Valves with NPT threaded ports are intended for use with the Standard Galvanized Semi-Assembled DPV-1 Valve Trim described in Figures 3, 4 and 5 of this document. Valves with ISO threaded ports are intended for use with special order trim that is provided by local distributors to meet the specific needs of certain localities. Please contact your local distributor regarding valves and valve trim for specific localities.

Specify: (specify size) Model DPV-1 Dry Pipe Valve with (specify) End Connections and (specify NPT or ISO) threaded ports, P/N (specify):

Other 2-1/2 Inch (DN65) Valves with NPT Threaded Ports
Groove x Groove,
3.00 Inch (76,1 mm) O.D.
Grooves 52-309-1-930

PS10 SERIES
PRESSURE SWITCH

Patent Pending

(UL, cUL, and CSFM Listed, FM and LPC Approved, NYMEA Accepted, CE Marked Pending)

Dimensions: 3.78" (9,6cm)W x 3.20" (8,1cm)D x 4.22" (10,7cm)H

Conduit Entrance: Two knockouts provided for 1/2" conduit. Individual switch compartments and ground screws suitable for dissimilar voltages.

Enclosure: Cover - Die-cast with textured red powdercoat finish, single cover screw and rain lip.

Base - Die-cast

Pressure Connection: Nylon 1/2" NPT Male

Factory Adjustment: 4 - 8 PSI (0,27 - 0,55 BAR)
Differential: 2 PSI (0,13 BAR) typical

Maximum System Pressure: 300 PSI (20,68 BAR)

Switch Contacts: SPDT (Form C)
10.1 Amps at 125/250VAC, 2.0 Amps at 30VDC
One SPDT in PS10-1, Two SPDT in PS10-2

Environmental Specifications:
NEMA 4/IP55 Rated Enclosure - indoor or outdoor when used with NEMA 4 conduit fittings.
Temperature range: -40°F to 140°F (-40°C to 60°C)

Service Use:

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

Ordering Information

Model	Description	Stock No.
PS10-1	Pressure switch with one set SPDT contacts	1340103
PS10-2	Pressure switch with two sets SPDT contacts	1340104
	Hex Key	5250062
	Cover Tamper Switch Kit	0090200

Tamper
Cover incorporates tamper resistant fastener that requires a special key for removal. One key is supplied with each device. For optional cover tamper switch kit, order Stock No. 0090200. See bulletin #5401200 PSCTSK.

Installation
The Potter PS10 Series Pressure Actuated Switches are designed for the detection of a waterflow condition in automatic fire sprinkler systems of particular designs such as wet pipe systems with alarm check valves, dry pipe, preaction, or deluge valves. The PS10 is also suitable to provide a low pressure supervisory signal; adjustable between 4 and 15 psi (0,27 and 1,03 BAR).
1. Apply Teflon tape to the threaded male connection on the device. (Do not use pipe dope)
2. Device should be mounted in the upright position (threaded connection down).
3. Tighten the device using a wrench on the flats on the device.

Wiring Instructions
1. Remove the tamper resistant screw with the special key provided.
2. Carefully place a screwdriver on the edge of the knockout and sharply apply a force sufficient to dislodge the knockout plug. See Fig 9
3. Run wires through an approved conduit connector and affix the connector to the device.
4. Connect the wires to the appropriate terminal connections for the service intended. See Figures 2,4,5, and 6. See Fig 7 for two switch, one conduit wiring.

Testing
The operation of the pressure alarm switch should be tested upon completion of installation and periodically thereafter in accordance with the applicable NFPA codes and standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

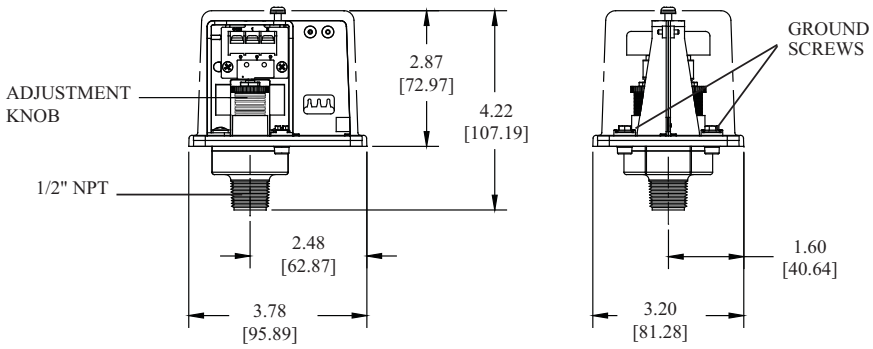
Wet System
Method 1: When using PS10 and control unit with retard - connect PS10 into alarm port piping on the input side of retard chamber and electrically connect PS10 to control unit that provides a retard to compensate for surges. Insure that no unsupervised shut-off valves are present between the alarm check valve and PS10.
Method 2: When using the PS10 for local bell application or with a control that does not provide a retard feature - the PS10 must be installed on the alarm outlet side of the retard chamber of the sprinkler system.
Testing: Accomplished by opening the inspector's end-of-line test valve. Allow time to compensate for system or control retard.
Note: Method 2 is not applicable for remote station service use, if there is an unsupervised shut-off valve between the alarm check valve and the PS10.

Wet System With Excess Pressure
Connect PS10 into alarm port piping extending from alarm check valve. Retard provisions are not required. Insure that no unsupervised shut-off valves are present between the alarm check valve and the PS10.
Testing: Accomplished by opening the water by-pass test valve or the inspector's end-of-line test valve. When using end-of-line test, allow time for excess pressure to bleed off.

Dry System
Connect PS10 into alarm port piping that extends from the intermediate chamber of the alarm check valve. Install on the outlet side of the in-line check valve of the alarm port piping. Insure that no unsupervised shut-off valves are present between the alarm check valve and the PS10.
Testing: Accomplished by opening the water by-pass test valve.
Note: The above tests may also activate any other circuit closer or water motor gongs that are present on the system.

Dimensions

Fig. 1

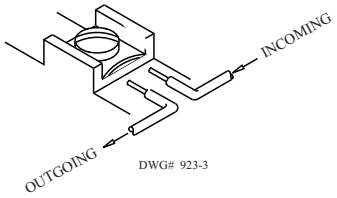


NOTE: To prevent leakage, apply Teflon tape sealant to male threads only.

DWG# 930-1

Switch Clamping Plate Terminal

Fig. 2

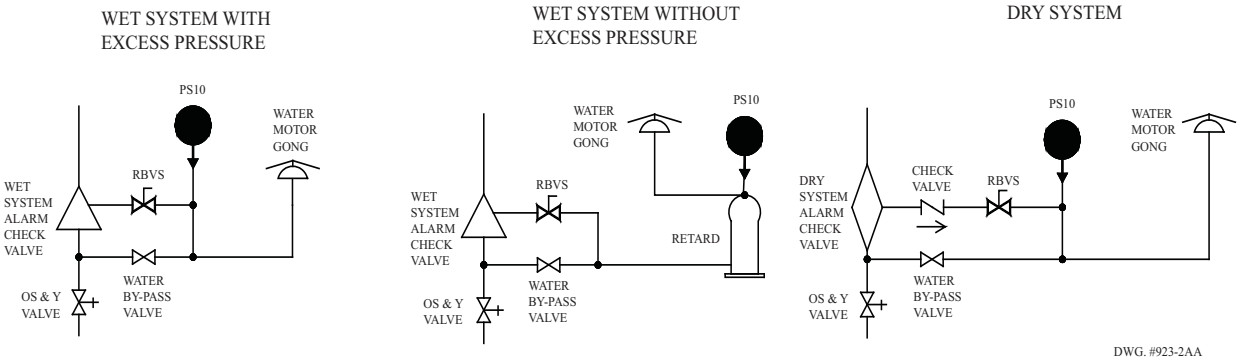


⚠ WARNING

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

Typical Sprinkler Applications

Fig. 3

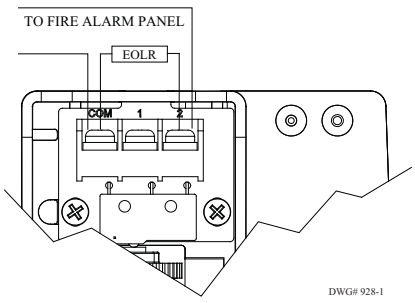


⚠ CAUTION

Closing of any shutoff valves between the alarm check valve and the PS10 will render the PS10 inoperative. To comply with NFPA-72 any such valve shall be electrically supervised with a supervisory switch such as Potter Model RBVS.

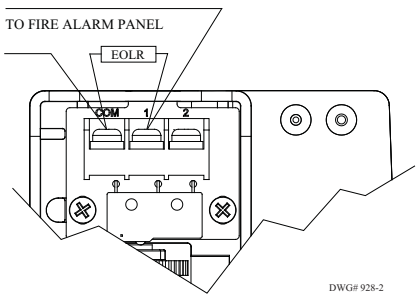
Low Pressure Signal Connection

Fig. 4



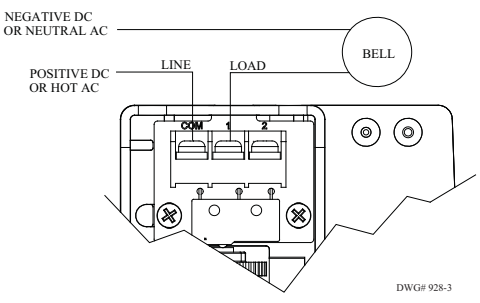
Waterflow Signal Connection

Fig. 5



Local Bell For Waterflow Connection

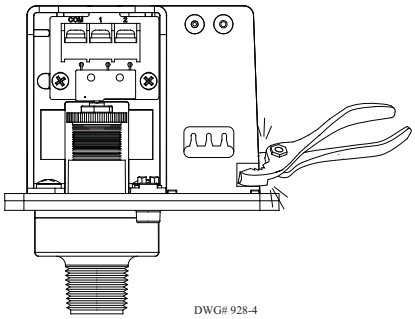
Fig. 6



One Conduit Wiring

Fig. 7

Break out thin section of divider to provide path for wires when wiring both switches from one conduit entrance.



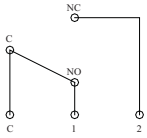
DWG# 928-4

Switch Operation

Fig. 8

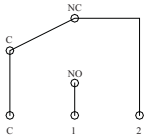
Terminal
C: Common
1: Closed when installed under normal system pressure.
2: Open when installed under normal system pressure. Closes on pressure drop. Use for low pressure supervision.

W/ PRESSURE APPLIED



Terminal
1: Open with no pressure supplied. Closes upon detection of pressure. Use for waterflow indication.
2: Closed with no pressure applied.

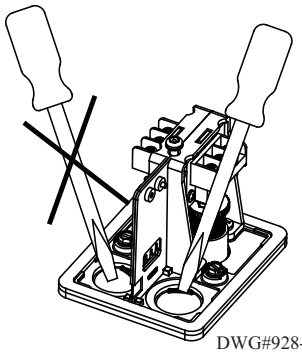
W/O PRESSURE APPLIED



DWG#928-6

Removing Knockouts

Fig. 9



DWG#928-5

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Read all instructions carefully and understand them before starting installation. Save instructions for future use. Failure to read and understand instructions could result in improper operation of device resulting in serious injury or death.
- Risk of explosion. Not for use is hazardous locations. Serious injury or death could result.

⚠ CAUTION

- Do not tighten by grasping the switch enclosure. Use wrenching flats on the bushing only. Failure to install properly could damage the switch and cause improper operation resulting in damage to equipment and property.
- To seal threads, apply Teflon tape to male threads only. Using joint compounds or cement can obstruct the pressure port inlet and result in improper device operation and damage to equipment.
- Do not over tighten the device, standard piping practices apply.

Engineer/Architect Specifications Pressure Type Waterflow Switch

Pressure type waterflow switches; shall be a Model PS10 as manufactured by Potter Electric Signal Company, St Louis MO., and shall be installed on the fire sprinkler system as shown and or specified herein.

Switches shall be provided with a ½" NPT male pressure connection and shall be connected to the alarm port outlet of; Wet Pipe Alarm Valves, Dry Pipe Valves, Pre-Action Valves, or Deluge Valves. The pressure switch shall be actuated when the alarm line pressure reaches 4 - 8 PSI (0,27 - 0,55 BAR).

Pressure type waterflow switches shall have a maximum service pressure rating of 300 PSI (20,68 BAR) and shall be factory adjusted to operate on a pressure increase of 4 - 8 PSI (0,27 - 0,55 BAR)

Pressure switch shall have one or two form C contacts, switch contact rating 10.1 Amps at 125/250 VAC, 2.0 Amps at 30 VDC.

Pressure type waterflow switches shall have two conduit entrances one for each individual switch compartment to facilitate the use of dissimilar voltages for each individual switch.

The cover of the pressure type waterflow switch shall be Zinc die-cast with rain lip and shall attach with one tamper resistant screw. The Pressure type waterflow switch shall be suitable for indoor or outdoor service with a NEMA 4/IP55 rating.

The pressure type waterflow switch shall be UL Ulc and CSFM listed, FM and LPC approved and NYMEA accepted.

PS40 SERIES
PRESSURE SWITCH

(UL, cUL, and CSFM Listed, FM and LPC Approved, NYMEA Accepted, CE Marked Pending)

Dimensions: 3.78" (9,6cm)W x 3.20" (8,1cm)D x 4.22" (10,7cm)H

Conduit Entrance: Two knockouts provided for 1/2" conduit. Individual switch compartments and ground screw suitable for dissimilar voltages

Enclosure: Cover- Die-cast with textured red powdercoat finish, single cover screw and rain lip.
Base- Die-cast

Pressure Connection: Nylon 1/2" NPT male

Factory Adjustment: PS40-1 operates on decrease at 30 PSI (2,1 BAR)
PS40-2 operates in increase at 50 PSI (3,5 BAR) and on decrease at 30 PSI (2,1 BAR)

Pressure Range: 10-60 PSI (,7 - 4,1 BAR)

Differential: Typical 1 lb. at 10 PSI (,07 at ,7 BAR)
4 lbs at 60 PSI (,28 at 4,1 BAR)

Maximum System Pressure: 300 PSI (20,68 BAR)

Switch Contacts: SPDT (Form C)
10.1 Amps at 125/250VAC, 2.0 Amps at 30VDC
One SPDT in PS40-1, Two SPDT in PS40-2

Environmental Specifications:
NEMA 4/IP55 Rated Enclosure - indoor or outdoor when used with NEMA 4 conduit fittings.
Temperature range: -40°F to 140°F (-40°C to 60°C)

Tamper: Cover incorporates tamper resistant fastener that requires a special key for removal. One key is supplied with each device. For optional cover tamper switch kit, order Stock No. 0090200. See bulletin #5401200 PSCTSK.

Service Use:

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

Ordering Information

Model	Description	Stock No.
PS40-1	Pressure switch with one set SPDT contacts	1340403
PS40-2	Pressure switch with two sets SPDT contacts	1340404
	Hex Key	5250062
	Cover Tamper Switch Kit	0090200
BVL	Bleeder valve	1000018

Installation

The Potter PS40 Series Pressure Actuated Switches are designed primarily to detect an increase and/or decrease from normal system pressure in automatic fire sprinkler systems. Typical applications are: Dry pipe system, pre-action air/nitrogen supervision, pressure tanks, air supplies, and water supplies. The PS40 switch is factory set for 40 PSI (2,8 BAR) normal system pressure. The switch marked with the word LOW is set to operate at a pressure decrease of 10 PSI (,7 BAR) at 30 PSI (2,1 BAR). The switch marked with the word HIGH is set to operate at a pressure increase of 10 PSI (,7 BAR) at 50 PSI (3,5 BAR). See section heading **Adjustments and Testing** if other than factory set point is required.

1. Connect the PS40 to the system side of any shutoff or check valve.
2. Apply Teflon tape to the threaded male connection on the device. (Do not use pipe dope)
3. Device should be mounted in the upright position. (Threaded connection down)
4. Tighten the device using a wrench on the flats on the device.

Wiring Instructions

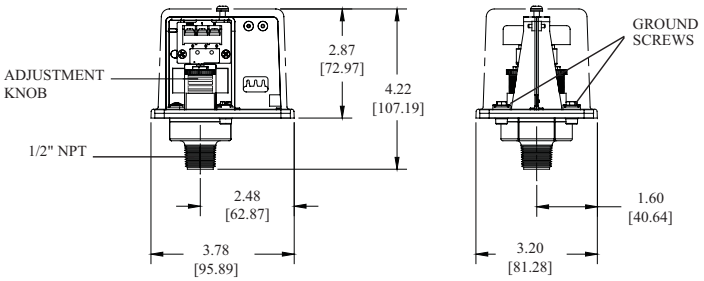
1. Remove the tamper resistant screw with the special key provided.
2. Carefully place a screwdriver on the edge of the knockout and sharply apply a force sufficient to dislodge the knockout plug. See Fig. 9
3. Run wires through an approved conduit connector and affix the connector to the device. A NEMA-4 rated conduit fitting is required for outdoor use.
4. Connect the wires to the appropriate terminal connections for the service intended. See Figures 2,4,5,6, and 8

Adjustment And Testing

The operation of the pressure supervisory switch should be tested upon completion of installation and periodically thereafter in accordance with the applicable NFPA codes and standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).
Note: Testing the PS40 may activate other system connected devices.
The use of a Potter BVL (see product bulletin 8900067 for details) is recommended to facilitate setting and testing of the PS40 pressure switch. When a BVL (bleeder valve) is used, the pressure to the switch can be isolated and bled from the exhaust port on the BVL without effecting the supervisory pressure of the entire system. See Fig. 3
The operation point of the PS40 Pressure Switch can be adjusted to any point between 10 and 60 PSI (0,7 - 4,11 BAR) by turning the adjustment knob(s) clockwise to raise the actuation point and counter clockwise to lower the actuation point. In the case of the PS40-2, both switches operate independent of each other. Each switch may be independently adjusted to actuate at any point acrosss the switch adjustment range. Initial adjustment can be made with a visual reference from the top of the adjustment knob across to the printed scale on the switch bracket. Final adjustments should be verified with a pressure gauge.

Dimensions

Fig. 1

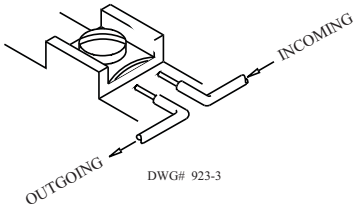


NOTE: To prevent leakage, apply Teflon tape sealant to male threads only.

DWG# 930-1

Switch Clamping Plate Terminal

Fig. 2



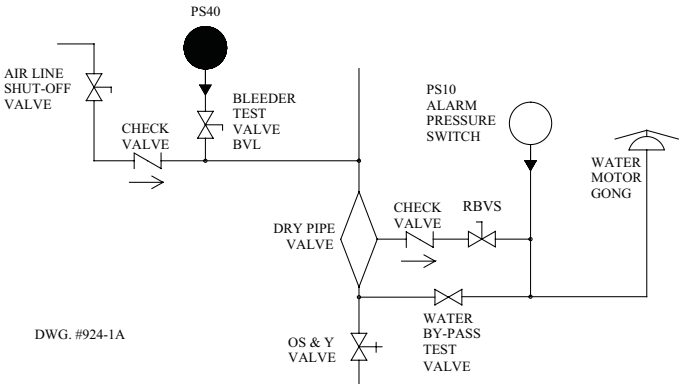
DWG# 923-3

⚠ WARNING

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

Typical Sprinkler Applications

Fig. 3



DWG. #924-1A

⚠ CAUTION

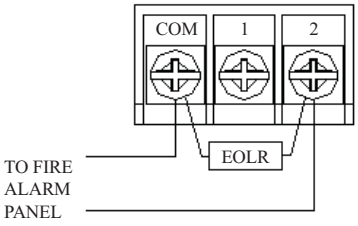
Closing of any shutoff valves between the alarm check valve and the PS10 will render the PS10 inoperative. To comply with NFPA-72 any such valve shall be electrically supervised with a supervisory switch such as Potter Model RBVS.

Typical Connections

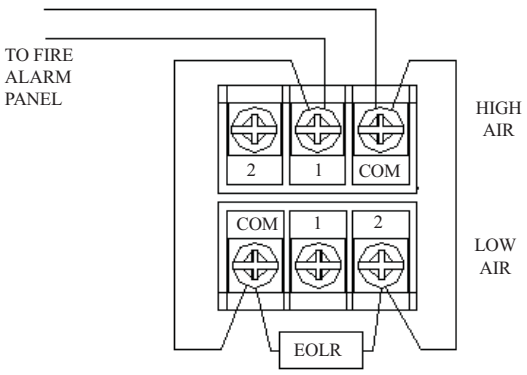
Fig. 4

WITH NORMAL SYSTEM PRESSURE APPLIED LOW -TERMINAL 2 CLOSES ON PRESSURE DROP.

PS40-1



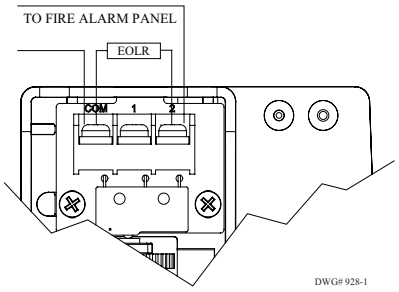
PS40-2



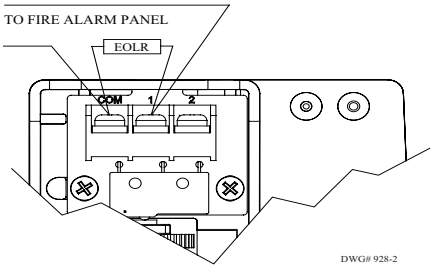
WITH NORMAL SYSTEM PRESSURE APPLIED HIGH - TERMINAL 1 WILL CLOSE ON PRESSURE INCREASE.

DWG# 930-2

Low Pressure Signal Connection
Fig. 5

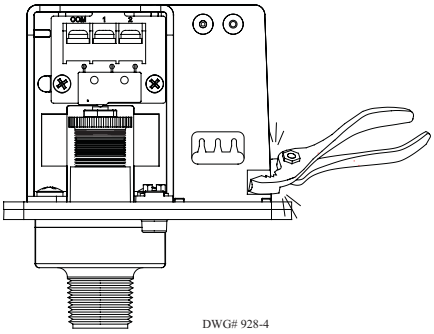


High Pressure Signal Connection
Fig. 6



One Conduit Wiring
Fig. 7

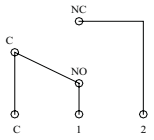
Break out thin section of divider to provide path for wires when wiring both switches from one conduit entrance.



Changing Pressure
(With normal system pressure)
Fig. 8

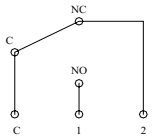
Terminal
C: Common
1: Closed when installed under normal system pressure.
2: Open when installed under normal system pressure. Closes on pressure drop. Use for low air signal.

LOW PRESSURE SWITCH



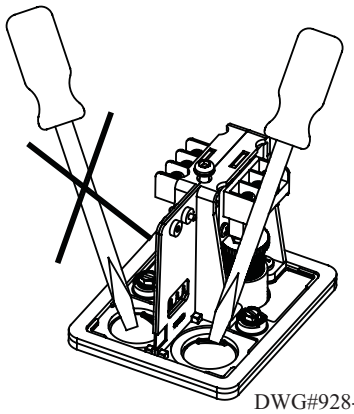
Terminal
1: Open when installed under normal system pressure. Closes on increase in pressure. Use for high air signal.
2: Closed under normal system pressure.

HIGH PRESSURE SWITCH



DWG# 930-3

Removing Knockouts
Fig. 9



DWG#928-5

Engineer/Architect Specifications Pressure Type Waterflow Switch

Pressure type supervisory switches; shall be a Model PS40 as manufactured by Potter Electric Signal Company, St. Louis, MO., and shall be installed on the fire sprinkler system as shown and or specified herein.

Switches shall be provided with a 1/2" NPT male pressure connection to be connected into the air supply line on the system side of any shut-off valve. A Model BVL bleeder valve as supplied by Potter Electric Signal Company of St. Louis, MO., or equivalent shall be connected in line with the PS40 to provide a means of testing the operation of the supervisory switch. (See Fig. 3)

The switch unit shall contain SPDT (Form C) switch(es). One switch shall be set to operate at a pressure decrease of 10 PSI (0,7 BAR) from normal. If two switches are provided, the second switch shall be set to operate at a pressure increase of 10 PSI (0,7 BAR) from normal.

Switch contacts shall be rated at 10.1 Amps at 125/250VAC and 2.0 Amps at 30VDC. The units shall have a maximum pressure rating of 300 PSI (20,68 BAR) and shall be adjustable from 10 to 60 PSI (0,7 to 4,1 BAR).

Pressure switches shall have two conduit entrances, one for each individual switch compartment to facilitate the use of dissimilar voltages for each individual switch.

The cover of the pressure switch shall be zinc die-cast with rain lip and shall attach with one tamper resistant screw. The pressure switch shall be suitable for indoor or outdoor service with a NEMA-4/IP55 rating.

The pressure switch shall be UL, ULC, and CSFM listed, FM and LPC approved and NYMEA accepted.

⚠ WARNING

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Read all instructions carefully and understand them before starting installation. Save instructions for future use. Failure to read and understand instructions could result in improper operation of device resulting in serious injury or death.
- Risk of explosion. Not for use is hazardous locations. Serious injury or death could result.

⚠ CAUTION

- Do not tighten by grasping the switch enclosure. Use wrenching flats on the bushing only. Failure to install properly could damage the switch and cause improper operation resulting in damage to equipment and property.
- To seal threads, apply Teflon tape to male threads only. Using joint compounds or cement can obstruct the pressure port inlet and result in improper device operation and damage to equipment.
- Do not over tighten the device, standard piping practices apply.

Electrical specs on page 2

GENERAL AIR PRODUCTS

OL Plus Series - Single Phase, Riser Mounted Air Compressors for Dry Pipe Sprinkler Systems

OL Plus Series

This oil less riser mounted air compressor is UL1450 listed for use in sprinkler systems.

- UL1450 listed
- Oil Less Piston Compressor
- UL Listed Pressure Switch
- Bubble tight air check valve
- Permanently lubricated bearings
- Integrated Air Intake Filters
- Fully automatic, direct drive
- Max Pressure: 60 PSI
- 30” Stainless Steel Flex Hose
- Riser Mounting Kit

- Specifically designed to fill the sprinkler system to 40 PSI in 30 minutes

System Capacity+	Model Number	Average CFM**	Motor HP	Recommended Wire Size++	Dimensions			Weight (lbs)
					L	W	H	
125 gal.	OL12516AC	1.52	1/6	12	16”	12”	12”	30
250 gal.	OL25033AC	3.03	1/3	12	16”	12”	12”	31
365 gal.	OL36550AC	4.43	1/2	12	16”	15”	10”	38
430 gal.	OL43075AC	5.21	3/4	10	17”	15”	10”	48
615 gal.	OL615100AC*	7.46	1	6	17”	15”	10”	48
915 gal.	OL915150AC*	11.10	1 1/2	6	23”	15”	10”	60
1225 gal.	OL1225200AC*	14.85	2	10	24”	15”	11”	70

Accessories:

Air Maintenance Device - *Part # AMD-1*

The AMD-1 regulates the volume of air being delivered to the sprinkler system by the air compressor.

Per NFPA 13 - An Air Maintenance Device is required on every system unless the air compressor has a capacity less than 5.5 ft3/min at 10 psi.

Motor Line Starters - *Thermal Overload Protection*

Single Phase

Maximum HP	115V	208/230V	Size	Model
	1/3 HP	1 HP	00	MG00A
	1 HP	2 HP	0	MGX0A
	2 HP	3 HP	1	MG01A
	3 HP	5 HP	1P	MG15A

When Ordering a Motor Starter you must specify HP, Voltage and Phase that is supplied to the motor.

Notes:

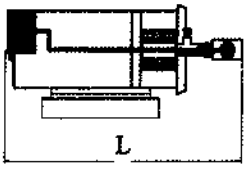
+ System Capacity based on 70°F system temperature.

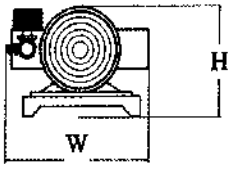
** Average CFM is the average free air delivery from 0 to 40 PSIG

++ Recommended Wire Sizes based on 100ft run. consult factory for longer or shorter runs.

* Compressor has a capacity above 5.5 CFM at 10 PSI. Air Maintenence Device required per NFPA 13

VOLTAGE - All Single Phase Units 115 or 208-230 Volt except OL1225200AC which is 208-230 only.





OL Plus Series - Single Phase Riser Mounted Fire Protection Air Compressor Electrical Cut Sheet

OL Plus Series

This oil less riser mounted air compressor is UL1450 listed for use in sprinkler systems.

Model Number	Nominal HP	Factory Wired Voltage	Amperage (amps)			Recommended Wire Size Based on Run Length (gage)		
			Voltage	FLA	Start Up	25 FT	50 FT	100 FT
OL12516AC	1/6	115	115	5	35	12	12	12
			208	2.3	16.1	12	12	12
			230	2.5	17.5	12	12	12
OL25033AC	1/3	115	115	7.4	51.8	12	12	8
			208	3.5	24.5	12	12	12
			230	3.7	25.9	12	12	12
OL36550AC	1/2	115	115	10	70	12	10	8
			208	4.9	34.3	12	12	12
			230	5	35	12	12	12
OL43075AC	3/4	115	115	11.6	81.2	12	10	6
			208	5	35	12	12	12
			230	5.8	40.6	12	12	12
OL615100AC	1	115	115	18	126	12	8	6
			208	7.7	53.9	12	12	12
			230	9	63	12	12	12
OL915150AC	1 1/2	115	115	16.6	116.2	12	8	6
			208	8.2	57.4	12	12	12
			230	8.3	58.1	12	12	12
OL1225200AC	2	208-230	208	11.6	81.2	12	12	10
			230	11	77	12	12	10

Note:
Wire sizes are based on maintaining 90% of the nominal voltage at starting amps. Starting amps are assumed to be 6 times the SFA.

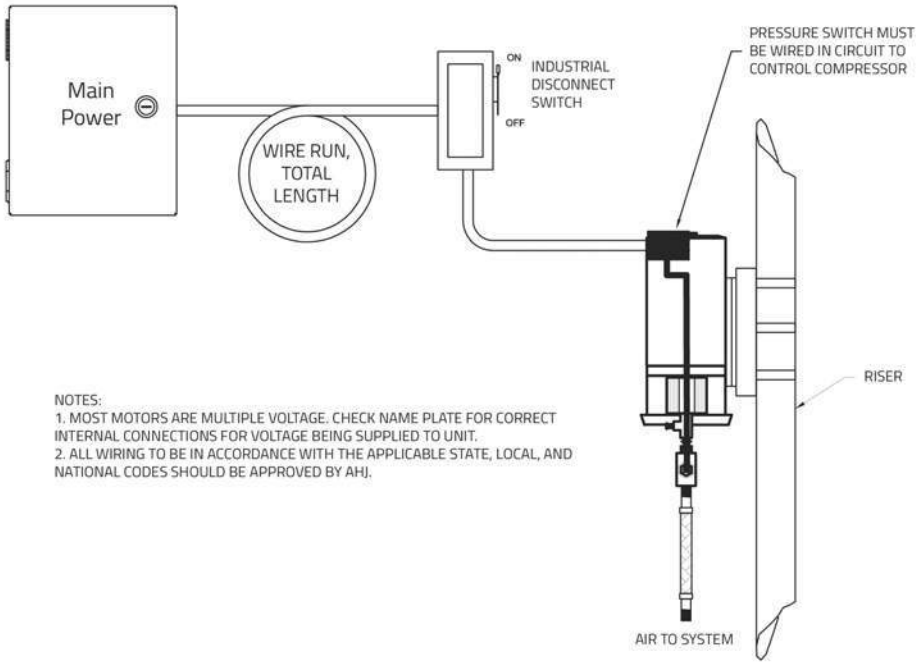
Warning:
Failure to consult with a licensed electrical professional can result in serious personal injury or death. Disconnect all power before servicing. Undersized wire between the motor and the power source will limit the starting and load carrying abilities of the motor causing motor overheating and permanent damage to the motor. Wire sizes listed are recommendations only. Consult the National Electric Code (NEC) and any applicable local electrical safety codes. The NEC and GAP recommends a maximum voltage drop of 3%. Install motors and related equipment in accordance with the National Electrical Code (NEC) local electrical safety codes and practices. **It is always the electrician's responsibility to determine and install a wire size that ensures motors can start and run well.**

OL Plus Series - Connection Diagram

OL Plus Series

This oil less riser mounted air compressor is UL1450 listed for use in sprinkler systems.

System Layout

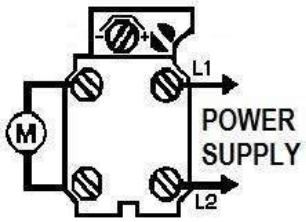


Pressure Switch Connection

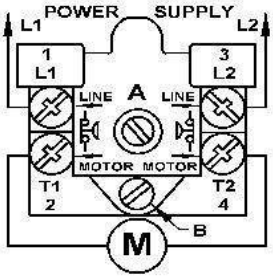
PRESSURE SWITCH Diagram

Note: Location of pressure switch varies based on model. This is a general diagram of components. For help specific to your switch please contact General Air Products.

SWP60401U-H
for 1/6 - 1/2 HP



SWP60601U
for 3/4 - 2 HP



Warning:

Failure to consult with a licensed electrical professional can result in serious personal injury or death. Disconnect all power before servicing. Undersized wire between the motor and the power source will limit the starting and load carrying abilities of the motor causing motor overheating and permanent damage to the motor. Wire sizes listed are recommendations only. Consult the National Electric Code (NEC) and any applicable local electrical safety codes. The NEC and GAP recommends a maximum voltage drop of 3%. Install motors and related equipment in accordance with the National Electrical Code (NEC) local electrical safety codes and practices. **It is always the electrician's responsibility to determine and install a wire size that ensures motors can start and run well.**

KENNEDY VALVE

UL-FM BUTTERFLY VALVES
FIGURES XBFV, XBFV-T, XBFV-W AND BB

1" - 12"

Overview

Designed for trouble free reliability, Kennedy Valve's UL Listed and FM Approved XBFV and BB Butterfly valves are ideal for use in fire protection systems. Kennedy's butterfly valves offer slow closing utilizing smooth gear operators.

All figure types are offered with a visual vane and wired supervisory switch and are available as either normally open or closed. Actuators are rated IP65.

Valve bodies are constructed of durable ductile iron or bronze for a lightweight superior product. We utilize stainless steel shafts as well as EPDM encapsulated discs. Bodoes are nylon coated for long-lasting service.

The BB-G grooved and BB-T threaded valves butterfly products are constructed of bronze and are UL Listed and FM Approved to 175psi.

The BB-G prouct is available in 2" and 2½" and the BB-T is avaiable from 1" thru 2½".

All XBFV valves have large diameter replaceable handwheels and switches to maintain system continuity during service and maintenance.

Manufacturing Standards - ISO 9001, ISO 14001, ISO 45001

UL

FM APPROVED

Technical Data

Available Sizes: 1" to 12" (DN25 - DN300)

UL Listed and FM Approved Pressure: XBFV and XBFV-T models 2" - 8" at 300 psi (20,7 bar)
XBFV and XBFV-T models 10" - 12" at 175psi (12,1 bar)
XBFV-W models 2" - 12" at 300psi (20,7 bar)
BB models 1"- 2½ at 175PSI (12,1 bar)

BODY CONSTRUCTION BY END CONDITION
Grooved: Ductile Iron, Brass/Bronze
Wafer: Ductile Iron
Threaded: Brass/Bronze

COATINGS
XBFV, XBFV-T and XBFV-W models: Nylon Coated

END CONDITION
Grooved: Standard IPS Grooves per ANSI/AWWA C606
Wafer: Suitable for fitup between ANSL Class 125/150 Flanges
Threaded Ends: NPT

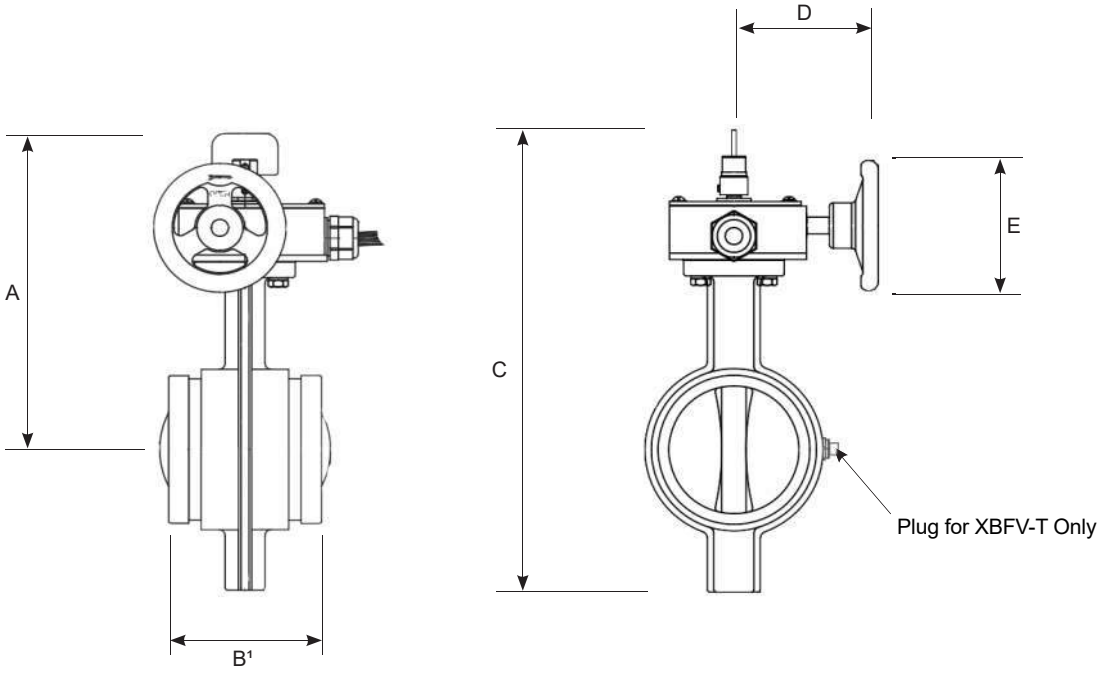
DISC
Disc: Ductile Iron or Bronze
Disc Coating: EPDM Encapsulated

STEM MATERIAL
Upper and Lower: Hardened 400 Series Stainless Steel

BODY TAPPING
XBFV-T come with two ⅜" tapped locations on 2 ½" - 3" valves and two ½" taps on all larger valves offering superior suitability for system risers or backflow installations.

APPLICATION
Operator Rated IP65 use.

OPTIONS
Contact customer service for additonal informaiton



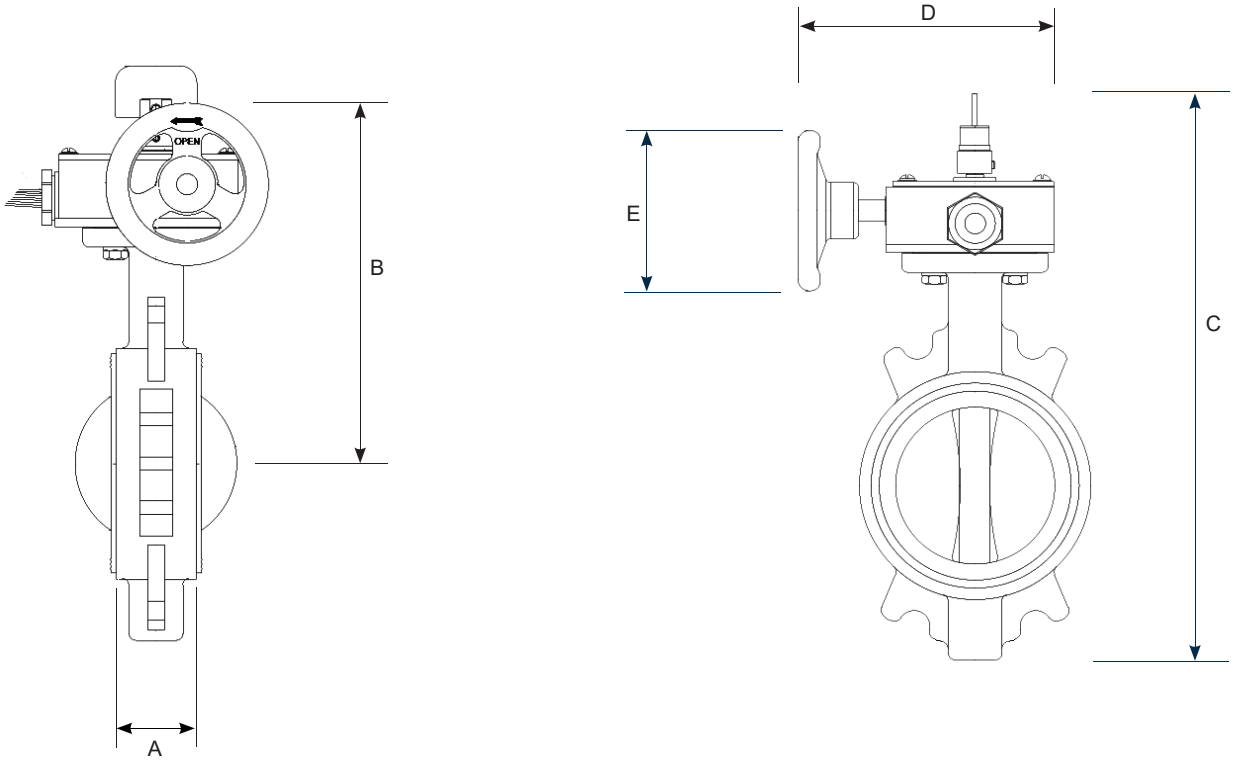
XBFV **XBFV-T**

Basic Components

No.	XBFV	XBFV-T	Description	Material
1	•	•	Body	Ductile Iron
2	•	•	Encapsualted Disc	Stainless Steel/EPDM Coated
3	•	•	Upper and Lower Stem	Stainaless Steel
4	•	•	Gear Box Assembly	Ductile Iron
5	•	•	Hand Wheel	Ductile Iron pinned to Gear Shaft
6	•	•	Position Indicator Flag	Carbon Steel
7	•	•	Supervisory Tamper Switch	Switch in Gear Box with Wiring Assembly
8		•	Plug (2)	Low Carbon Steel

Dimensions

Size (nom. inches)	A	B¹ XBFV	B² XBFV-T	C XBFV	C XBFV-T	D XBFV	D XBFV-T	E XBFV	E XBFV-T	XBFV Wt. (lbs)	XBFV-T WT. (lbs)
2" (DN50)	3.76	3.19	-	10.63		4.24		3.94		9.60	
2 ½" (DN65)	8.36	3.80	3.80	11.72	12.69	4.24	6.61	3.94	4.92	11.20	19.14
3" (DN80)	8.63	3.80	3.80	12.22	13.18	4.24	6.61	3.94	4.92	12.60	20.90
4" (DN100)	9.63	4.54	4.54	13.92	14.88	4.24	6.61	3.94	4.92	15.70	24.20
6" (DN150)	11.36	5.21	5.83	17.07	17.64	4.24	8.19	5.90	8.86	29.30	35.64
8" (DN200)	12.32	5.80	5.24	19.02	17.64	5.79	8.19	8.86	8.86	49.60	49.60
10" (DN250)	14.78	6.26	6.26	22.40	22.40	8.19	8.19	11.40	11.40	73.40	73.40
12" (DN300)	15.48	6.50	6.50	25.39	25.39	8.19	8.19	11.40	11.40	89.30	89.30

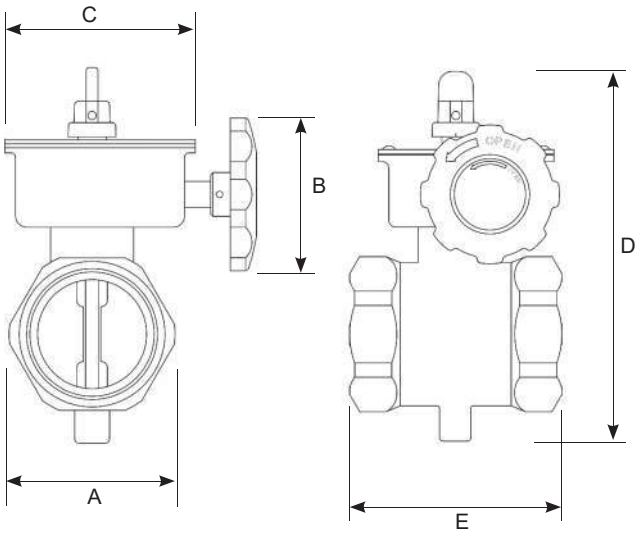


Basic Components

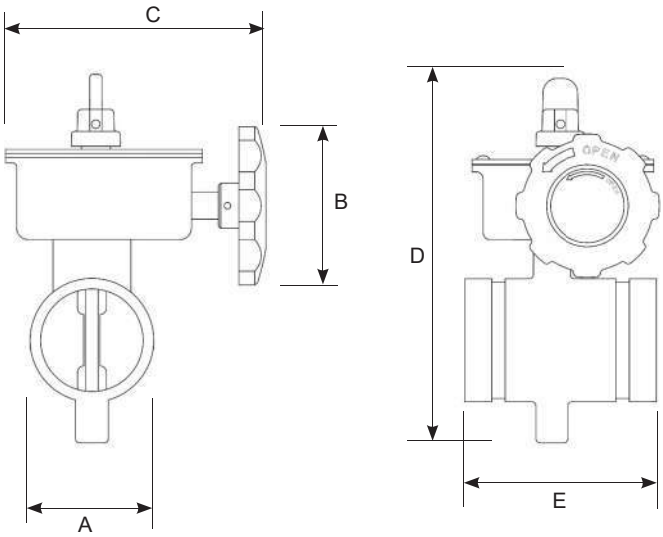
No.	XBFV-W	Description	Material
1	•	Body	Ductile Iron
2	•	Encapsualted Disc	Ductile Iron/EPDM Coated
3	•	Upper and Lower Stem	Stainaless Steel
4	•	Gear Box Assembly	Ductile Iron
5	•	Hand Wheel	Ductile Iron pinned to Gear Shaft
6	•	Position Indicator Flag	Carbon Steel
7	•	Supervisory Tamper Switch	Switch in Gear Box with Wiring Assembly

Dimensions

Size (nom. inches)	A	B	C	D	E	Weight (lbs)
2" (DN50)	1.73	7.36	10.63	6.27	4.92	11.46
2 ½" (DN65)	1.89	7.91	11.67	6.27	4.92	13.40
3" (DN80)	1.89	8.27	12.27	6.27	4.92	14.77
4" (DN100)	2.16	9.21	13.92	6.27	4.92	15.65
6" (DN150)	2.32	11.40	16.00	8.11	5.91	25.35
8" (DN200)	2.48	13.86	17.07	8.11	8.86	31.53
10" (DN250)	3.03	15.53	23.01	11.10	8.86	64.60
12" (DN300)	3.15	16.63	25.16	11.10	8.86	86.42



BB-T



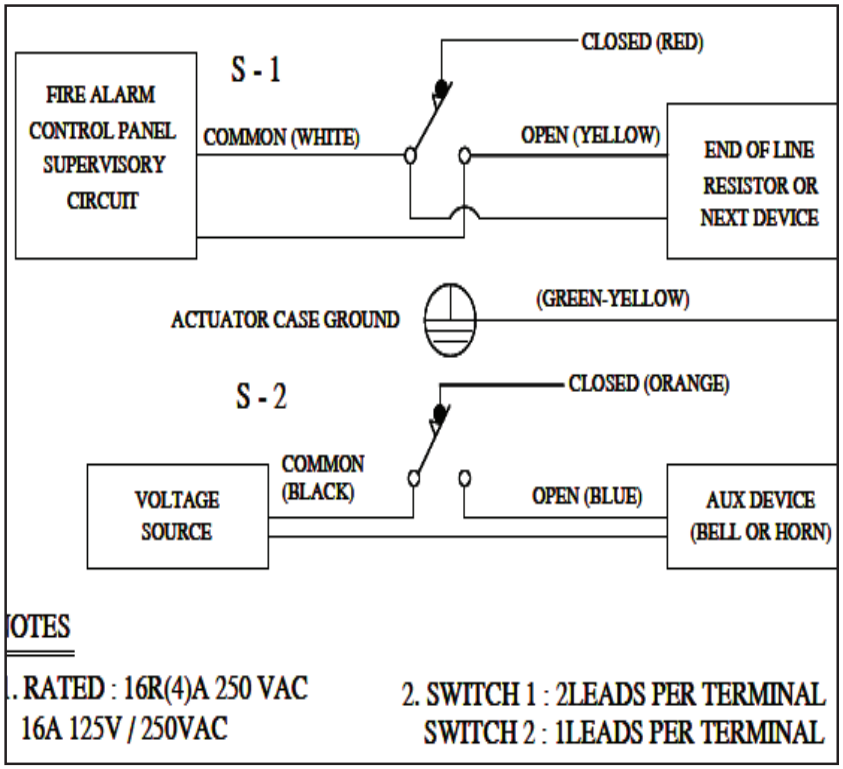
BB-G

Basic Components

No.	BFV-W	BB-T/G	Description	Material
1	•		Body	Brass/Bronze
1		•	Body	Brass/Bronze
2	•	•	Encapsualted Disc	Bronze/EPDM Coated
3	•	•	Upper and Lower Stem	Stainaless Steel
4	•	•	Gear Box Assembly	Carbon Steel
5	•	•	Hand Wheel	Carbon Steel
6	•	•	Position Indicator Flag	Carbon Steel
7	•	•	Supervisory Tamper Switch	Switch in Gear Box with Wiring Assembly

Dimensions

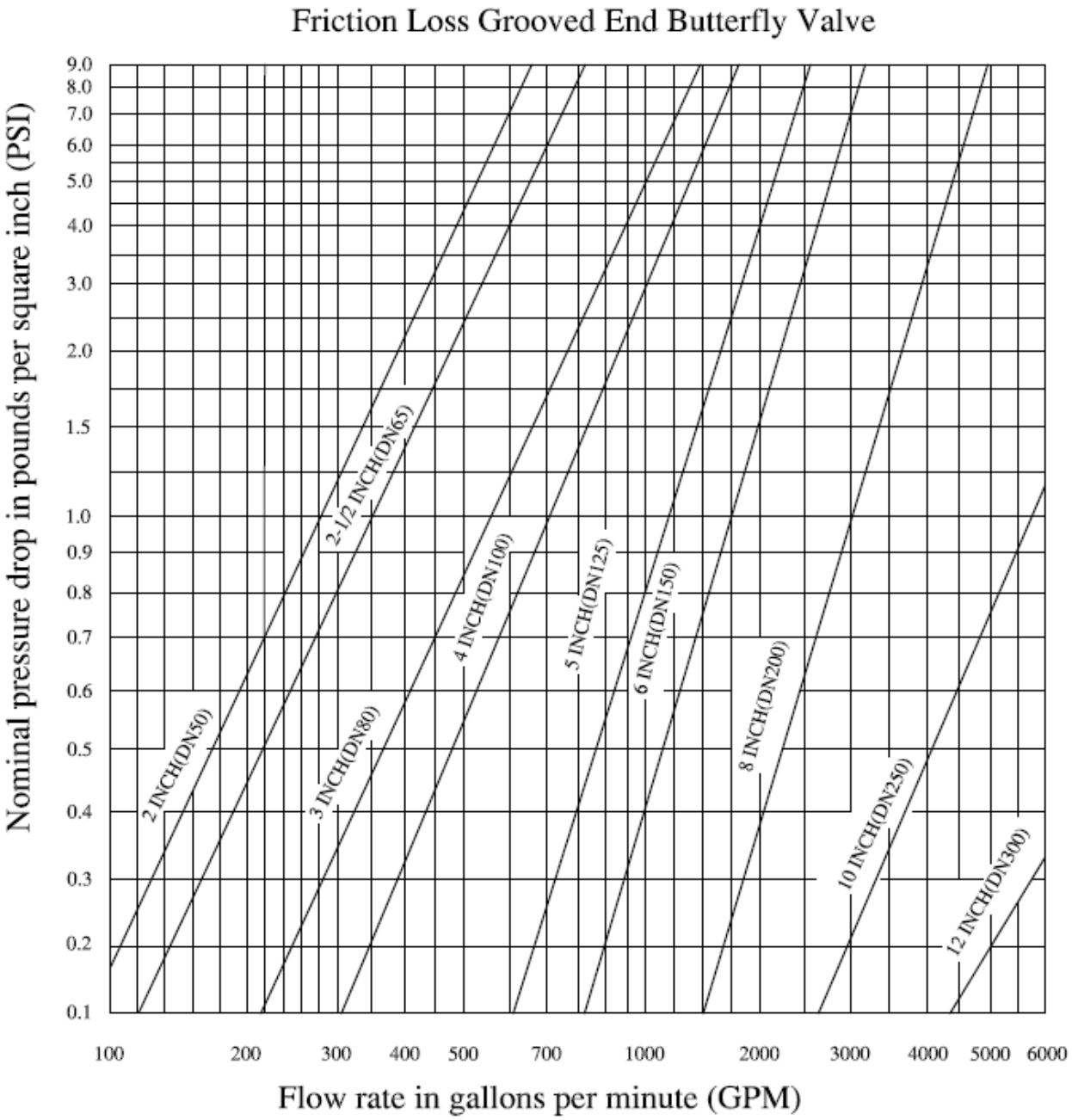
Size (nom. inches)	A	B	C	D	E	Weight (lbs)
1" (DN25)	1.72	1.78	2.44	4.30	2.13	3.30
1 ¼" (DN32)	2.09	1.78	2.44	4.63	2.64	3.74
1 ½" (DN40)	2.30	1.78	2.44	4.89	2.87	3.96
2" (DN50)	2.99	1.78	2.44	5.37	3.24	5.28
2 ½" (DN65)	3.50	1.78	2.44	5.68	4.09	6.62
2" (DN50)	2.37	1.78	2.44	5.21	4.49	4.84
2 ½" (DN65)	2.87	1.78	2.44	5.46	4.49	5.28

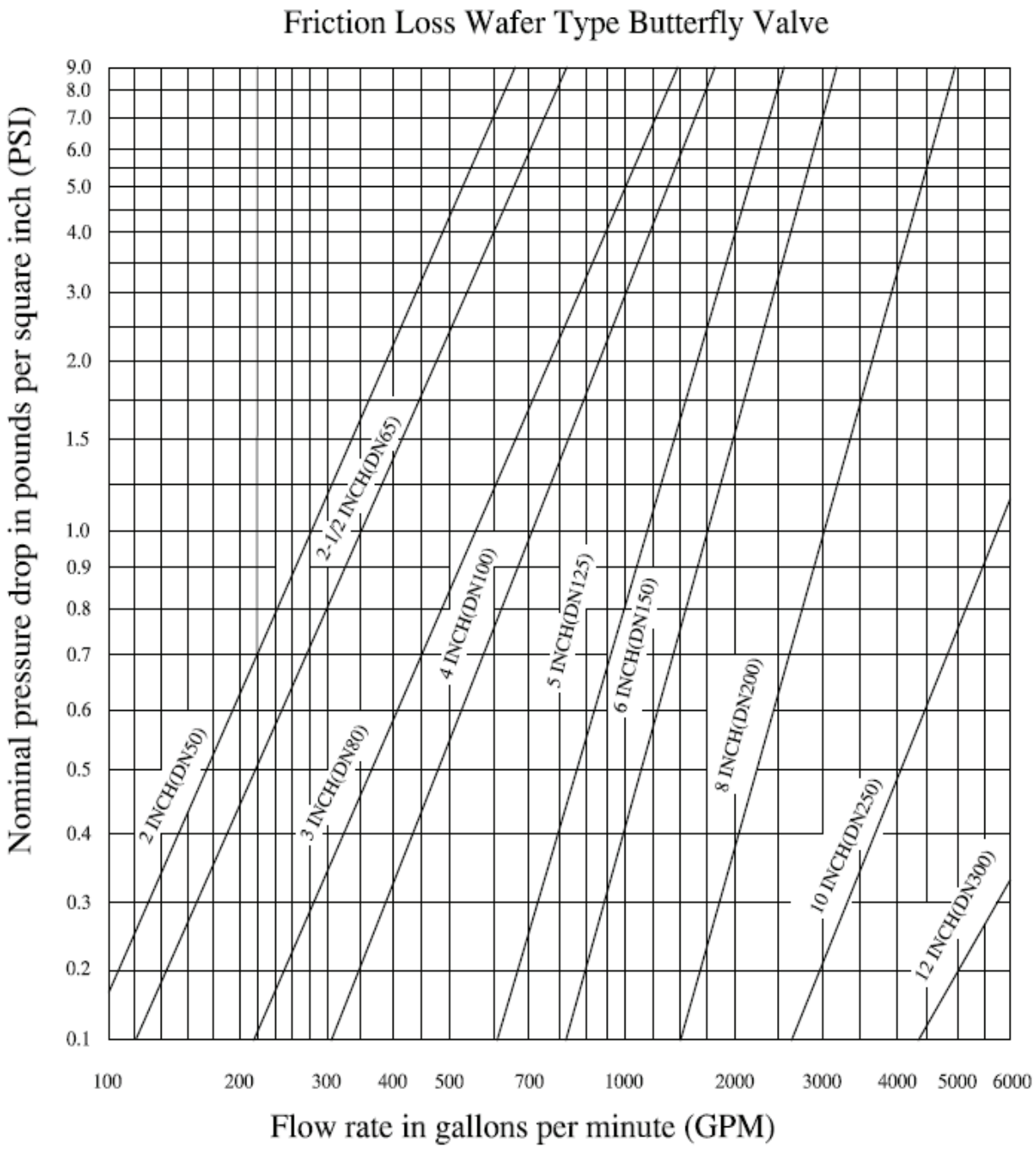


WIRING NOTES: Connection to power limited circuitry is required. Auxiliary switch is for supplemental use only, and shall not be used for fire alarm signaling applications.

Switches are checked at factory, check continuity with valve fully open, switches activate within two turns from open.

CAUTION: PRIOR TO INSTALLATION OF SUPERVISORY SWITCHES IN FIRE PROTECTION SYSTEMS REFER TO THE FOLLOWING STANDARDS:
NFPA 13: STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS
NFPA 25: INSPECTION, TESTING, MAINTENANCE OF WATER BASED FIRE PROTECTION SYSTEMS
NFPA 70: NATIONAL ELECTRICAL CODE
NFPA 72: NATIONAL FIRE ALARM CODE
CSA C22.1 NO.1 CANADIAN ELECTRICAL CODE, PA RT 1, SAFETY STANDARD FOR ELECTRICAL INSTALLATIONS SECTION 32
CAN/ULC-S524, STANDARD FOR INSTALLATION OF FIRE ALARM SYSTEMS


Friction Loss Grooved End Butterfly Valve
Nominal pressure drop in pounds per square inch (PSI)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.5
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
2 INCH(DN50)
2-1/2 INCH(DN65)
3 INCH(DN80)
4 INCH(DN100)
5 INCH(DN125)
6 INCH(DN150)
8 INCH(DN200)
10 INCH(DN250)
12 INCH(DN300)
100
200
300
400
500
700
1000
2000
3000
4000
5000
6000
Flow rate in gallons per minute (GPM)


Friction Loss Wafer Type Butterfly Valve
Nominal pressure drop in pounds per square inch (PSI)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.5
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
2 INCH(DN50)
2-1/2 INCH(DN65)
3 INCH(DN80)
4 INCH(DN100)
5 INCH(DN125)
6 INCH(DN150)
8 INCH(DN200)
10 INCH(DN250)
12 INCH(DN300)
100
200
300
400
500
700
1000
2000
3000
4000
5000
6000
Flow rate in gallons per minute (GPM)

UNITED BRASS WORKS, INC.

714 S. Main St., Randleman, NC 27317

Tel: 800-334-3035 Fax: 800-498-4696 www.ubw.com

Model 210A Swing Check Valve

200 WOG @ 180 ° Max
100% Pressure Tested • Integral Seat
Threaded Ends • Metal Disc

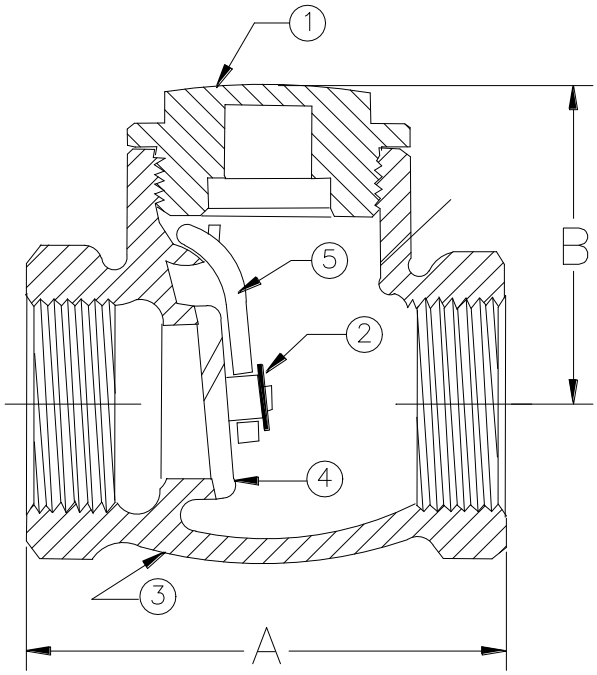
Swing Check Valve with 1/8" orifice in clapper.

Not Recommended for Pulsating or Vibrating Service!
Install in horizontal position only!

Contains Lead. Not for Use in Potable Water Systems

MATERIAL LIST

NO.	DESCRIPTION	MATERIAL
1	Cap (¼" – 1") Cap (1¼" – 2")	Bronze Brass
2	Washer	Brass
3	Body	Bronze
4	Disc	Brass
5	Hinge	Stainless Steel



Size	¼"	3/8"	½"	¾"	1"	1 ¼"	1 ½"	2"
A	1.89	1.89	2.14	2.51	3.03	3.45	3.81	4.44
B	1.22	1.22	1.28	1.53	2.06	2.20	2.20	2.86
Ship Wgt. (lbs.)	0.45	0.45	0.58	0.81	1.62	1.81	2.41	3.42
Qty. Unit Pack	12	12	12	12	6	6	4	2
Qty. Per Case	60	60	60	60	30	18	12	6

Sprinkler Gauge

Applications

- Fire sprinkler systems
- Suitable for all media that will not obstruct the pressure system or attack copper alloy parts

Special Features

- UL-listed (UL-393), United States and Canada
- Factory Mutual (FM) approved
- Reliable and economical

Standard Features

Design
EN 837-1 & ASME B40.100

Sizes
4” (100 mm)

Accuracy class
± 3/2/3% of span
(ASME B40.100 Grade B)

Ranges
0/80 psi, retard to 250 psi (air)
0/300 psi (water)

Working Pressure
Steady: 3/4 of full scale value
Fluctuating: 2/3 of full scale value
Short time: full scale value

Operating Temperature
Ambient: -40°F to 140°F
(-40°C to 60°C)
Media: 140°F (+60°C) maximum

Temperature Error
Additional error when temperature changes from reference temperature of 68°F (20°C) +0.4% for every 18°F (10°C) rising or falling. Percentage of span.

Manufactured by WIka Instrument

Specifications

Bourdon Tube
Material: copper alloy C-type

Pressure Connection
Material: copper alloy
1/4“ NPT lower mount (LM)

Movement
Copper alloy

Dial
White aluminum with stop pin; black and red lettering

Pointer
Black aluminum

Case
Black polycarbonate

Window
Snap-in clear polycarbonate

FM APPROVED

c UL us LISTED

Fire Protection Products, Inc
6241 Yarrow Dr., Suite A, Carlsbad, CA 92011-1541
For questions: 1 800 344-1822 • 1 800 344-3775 fax • www.fppi.com

POTTER
The Symbol of Protection

FOR SMALL PIPE

VSR-S
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

Stock No. 1144440

WARNING

Installation must be perfomed by qualified personnel and in accordance with all national and local codes and ordinances.

Shock hazard. Disconnect power source before servicing. Serious injury or death could result.

Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

UL, ULC, CSFM Listed and NYMEA Accepted

Service Pressure: Up to 300 PSI (20,7 BAR)

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

Maximum Surge: 18 FPS (5,5 m/s)

Enclosure: Die-cast, red enamel finish
Cover held in place with tamper resistant screws

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

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

Usage: Listed plastic, copper and schedule 40 iron pipe. Fits pipe sizes - 1" (25mm), 1 1/4" (32mm), 1 1/2" (38mm) and 2" (50mm)
Note: 12 paddles are furnished with each unit, one for each pipe size of threaded and sweat TEE, one for 1" (25mm) CPVC, one for 1" (25mm) CPVC (Central), one for 1" threaded Nibco CPVC, and one for 1 1/2" (38mm) threaded (Japan).

Environmental Specifications:

- NEMA-4/IP54 Rated enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature range: 40° F to 120° F, (4,5° C to 49° C) UL

Service Use:

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

Optional: Cover Tamper Switch Kit, Stock No. 0090148 (See Fig. 7 for terminations)

Replaceable Components: Retard/Switch Assembly, stock no. 1029030

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

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

Enclosure

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

Installation

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

Screw the device into the TEE fitting as shown in Fig. 2. Care must be taken to properly orient the device for the direction of waterflow.

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

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

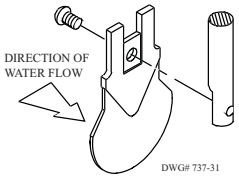
Note: Do not leave cover off for an extended period of time.

VSR-S
VANE TYPE WATERFLOW ALARM SWITCH WITH RETARD

Fig. 1

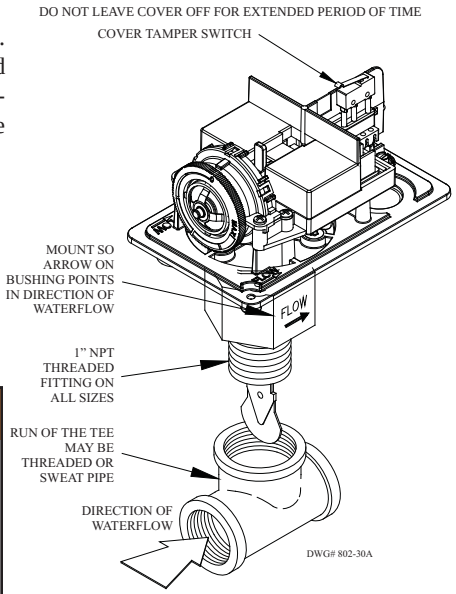
Retard Adjustment

The time delay is factory set at 30 ± 10 seconds. The delay can be adjusted by rotating the retard adjustment knob from 0 to the max setting (60-90 seconds). The time delay should be set at the minimum required to prevent false alarms.



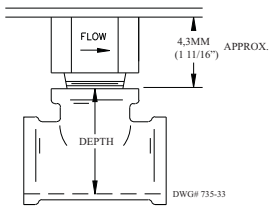
⚠ WARNING

There are 12 paddles furnished with each unit. One for each size of threaded, sweat or plastic TEE as described in Fig. 2. These paddles have raised lettering that shows the pipe size and type of TEE that they are to be used with. The proper paddle must be used. The paddle must be properly attached (see drawing) and the screw that holds the paddle must be securely tightened.



Shown with optional Cover Tamper Switch Kit.

Fig. 2



Screw the device into the tee fitting as shown. Care must be taken to properly orient the device for the direction of waterflow. On sweat tees, no threaded bushings, inserts, or adapters are permitted, unless they comply with the dimensions listed in the chart below.

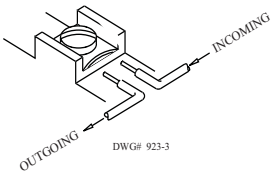
Important - The depth to the inside bottom of the tee should have the following dimensions:

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

⚠ WARNING

Do not use more than three wraps of teflon tape.

Fig. 3 Switch Terminal Connections Clamping Plate Terminal



⚠ WARNING

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

Fig. 7 Cover Tamper Switch Wiring

(Shown with cover in place)

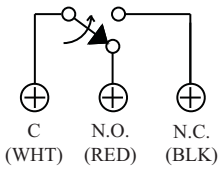
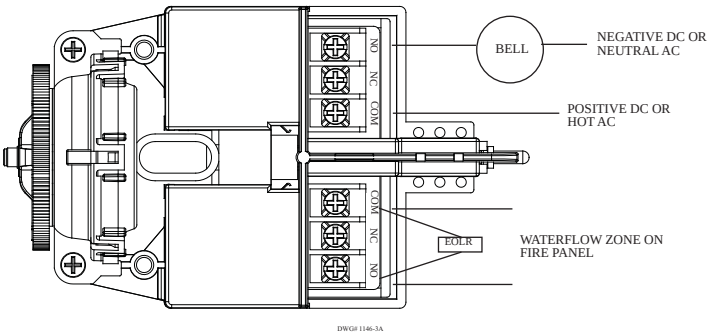


Fig. 4 Typical Electrical Connections



Notes:

1. The Model VSR-S has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other is used to operate a local audible or visual annunciator.
2. For supervised circuits see "Switch Terminal Connections" drawing and caution note (Fig. 3).

Fig. 5

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

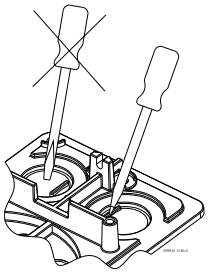
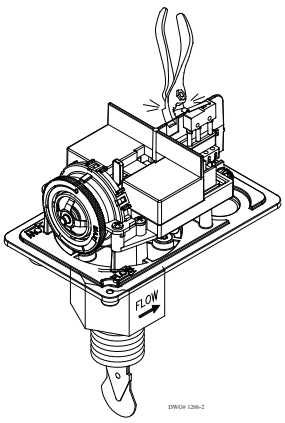


Fig. 6

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



Testing

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

An inspector's test valve (usually located at the end of the most remote branch line) should always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR-S is not recommended or advisable.

A minimum flow of 10 gpm (38 Lpm) is required to activate this device.

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

Maintenance

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

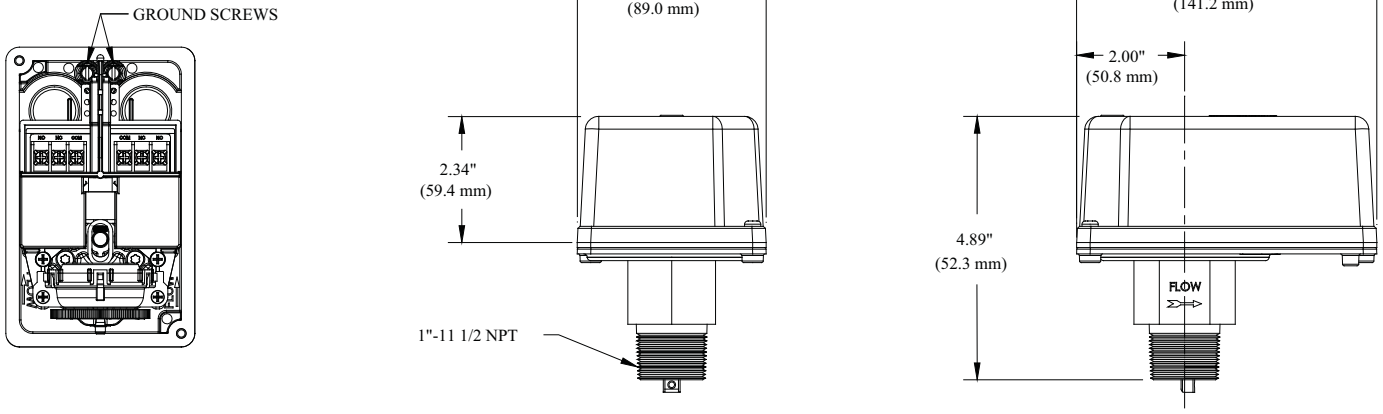
Removal

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

⚠ CAUTION

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

Mounting Dimensions



DWG# 1206-5

POTTER
The Symbol of Protection

BELLS
PBA-AC & MBA-DC

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

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

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

Size inches (mm)	Voltage	Model Number	Stock Number	Current (Max.)	Typical dB at 10 ft. (3m) (2)	Minimum dB at 10 ft. (3m) (1)
6 (150)	12VDC	MBA126	1750070	.12A	85	76
8 (200)	12VDC	MBA128	1750080	.12A	90	77
10 (250)	12VDC	MBA1210	1750060	.12A	92	78
6 (150)	24VDC	MBA246	1750100	.06A	87	77
8 (200)	24VDC	MBA248	1750110	.06A	91	79
10 (250)	24VDC	MBA2410	1750090	.06A	94	80
6 (150)	24VAC	PBA246	1806024*	.17A	91	78
8 (200)	24VAC	PBA248	1808024*	.17A	94	77
10 (250)	24VAC	PBA2410	1810024*	.17A	94	78
6 (150)	120VAC	PBA1206	1806120*	.05A	92	83
8 (200)	120VAC	PBA1208	1808120*	.05A	99	84
10 (250)	120VAC	PBA12010	1810120*	.05A	99	86

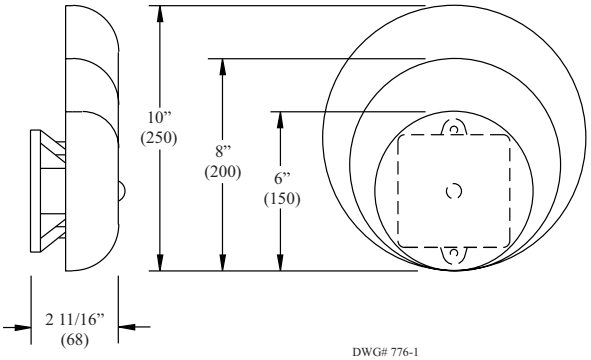
All DC bells are polarized and have built-in transient protection.
* Does not have ULC listing.

⚠ WARNING

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

Potter Electric Signal Company, LLC • 2081 Craig Road, St. Louis, MO, 63146-4161 • Phone: 800-325-3936/Canada 888-882-1833 • www.pottersignal.com

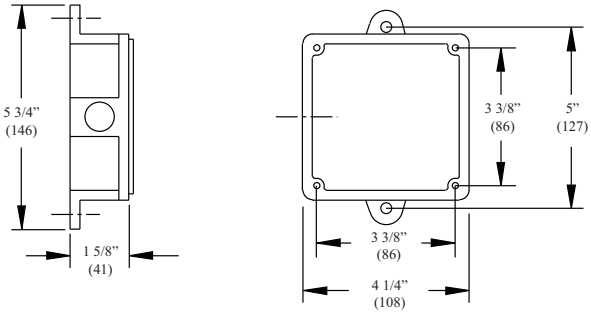
Bells Dimensions Inches (mm)
Fig. 1



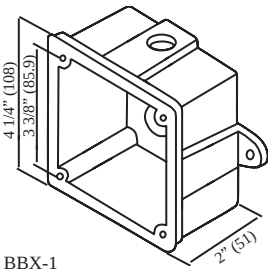
DWG# 776-1

Weatherproof Backbox Dimensions Inches (mm)
Fig. 2

Box has one threaded 1/2" conduit entrance

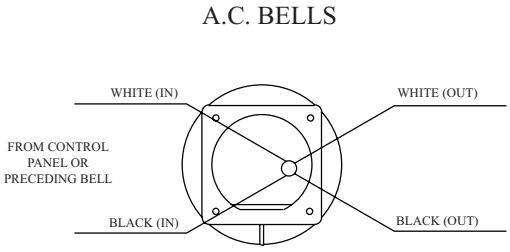


DWG# 776-2



BBX-1

Wiring (rear view)
Fig. 3

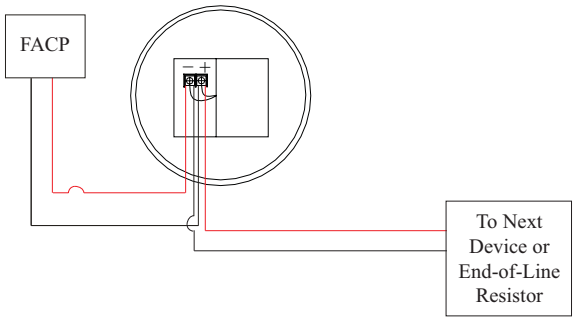


CAUTION:
WHEN ELECTRICAL SUPERVISION IS REQUIRED USE IN AND OUT LEADS AS SHOWN.

NOTES:

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

DWG# 776-3



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

⚠ WARNING

Failure to install striker down will prevent bell from operating.

tyco / Fire & Building Products

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

rapid response™
HOME FIRE SPRINKLER SYSTEM

BlazeMaster ®
CPVC Fire Sprinkler Pipe & Fittings
Submittal Sheet

General Description

Tyco® CPVC Pipe and Fittings produced by Tyco Fire & Building Products (TFBP) are designed exclusively for use in wet pipe automatic fire sprinkler systems. The Tyco CPVC Pipe and Fittings are produced from BlazeMaster® CPVC compound that is a specially developed thermoplastic compound composed of post chlorinated polyvinyl chloride (CPVC) resin and state of the art additives. Tyco CPVC Pipe and Fittings are easier to install than traditional steel pipe systems, and at the same time, provide superior heat resistance and strength as compared to traditional CPVC and PVC piping materials used in the plumbing trade. Various adapters are available to connect CPVC pipe to metallic piping. All female pipe thread adapters have brass inserts for durability. Grooved adapters connect directly to grooved end valves and metallic pipe, with flexible grooved end couplings.

NOTICE

Tyco® CPVC Pipe and Fittings produced with BlazeMaster® CPVC compound described herein must be installed and maintained in compliance with this document and with the applicable standards of the National Fire Protection Association, in addition to the standards of any authorities having jurisdiction. Failure to do so may impair the performance of these devices.

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

Technical Data

Sizes
3/4" to 3"

Maximum Working Pressure
175 psi

Approvals
UL, FM, C-UL, NSF, LPCB, MEA, and the City of Los Angeles. (Refer to Installation Handbook IH-1900 dated June 2008 for exact listing/approval information.)

Manufacture Source
U.S.A.

Material

- Pipe: ASTM F442, SDR 13.5
- Fittings: ASTM F438 (Sch. 40) and ASTM F439 (Sch. 80), ASTM F1970

Color
Orange

Installation

Tyco® CPVC Pipe and Fittings produced by Tyco Fire & Building Products (TFBP) are to be installed in accordance with Installation Handbook IH-1900 dated June 2008.

Care and Maintenance

The owner is responsible for the inspection, testing, and maintenance of their fire protection system and devices in compliance with this document, as well as with the applicable standards of the National Fire Protection Association (e.g., NFPA 25), in addition to the standards of any authority having jurisdiction. The installing contractor or product manufacturer should be contacted relative to any questions.

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

NOTICE

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

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

Limited Warranty

Products manufactured by Tyco Fire & Building Products (TFBP) are warranted solely to the original Buyer for ten (10) years against defects in material and workmanship when paid for and properly installed and maintained under normal use and service. This warranty will expire ten (10) years from date of shipment by TFBP. No warranty is given for products or components manufactured by companies not affiliated by ownership with TFBP or for products and components which have been subject to misuse, improper installation, corrosion, or which have not been installed, maintained, modified or repaired in accordance with applicable Standards of the National Fire Protection Association, and/or the standards of any other Authorities Having Jurisdiction. Materials found by TFBP to be defective shall be either repaired or replaced, at TFBP's sole option. TFBP neither assumes, nor authorizes any person to assume for it, any other obligation in connection with the sale of products or parts of products. TFBP shall not be responsible for sprinkler system design errors or inaccurate or incomplete information supplied by Buyer or Buyer's representatives.

In no event shall TFBP be liable, in contract, tort, strict liability or under any other legal theory, for incidental, indirect, special or consequential damages, including but not limited to labor charges, regardless of whether TFBP was informed about the possibility of such damages, and in no event shall TFBP's liability exceed an amount equal to the sales price.

The foregoing warranty is made in lieu of any and all other warranties, express or implied, including warranties of merchantability and fitness for a particular purpose.

This limited warranty sets forth the exclusive remedy for claims based on failure of or defect in products, materials or components, whether the claim is made in contract, tort, strict liability or any other legal theory.

This warranty will apply to the full extent permitted by law. The invalidity, in whole or part, of any portion of this warranty will not affect the remainder.

Schedule 10 and Schedule 40

FM Approved and UL Listed Sprinkler Pipe

Bull Moose Tube Company is a recognized producer of quality pipe products. Our Schedule 10 and Schedule 40 are FM Approved and UL Listed (for U.S. and Canada), even though these products do not require separate approvals and listings. Bull Moose Tube made the decision to have them approved and listed for your peace of mind. Our Sch. 10 and Sch. 40 have been through the same rigorous testing as our other fine pipe products.

Bull Moose Tube's Sch. 10 and Sch. 40 pipes are made to ASTM A135 and ASTM A795. These products are typically supplied with our protective coating but can be supplied without the coating so they can be hot-dip galvanized to meet FM requirements for use in dry systems in accordance with the zinc coating specifications of ASTM A795 or ASTM A53. All Schedule 10 and Schedule 40 pipe has a pressure rating of 300 PSI.

Schedule 10 Pipe

Nominal Pipe Size (in)	Nominal O.D. (in)	Nominal I.D. (in)	Weight/Ft	Bundle Size
1	1.315	1.097	1.41 lbs/ft	91
1 1/4	1.660	1.442	1.81 lbs/ft	61
1 1/2	1.900	1.682	2.09 lbs/ft	61
2	2.375	2.157	2.64 lbs/ft	37
2 1/2	2.875	2.635	3.53 lbs/ft	30
3	3.500	3.260	4.34 lbs/ft	19
4	4.500	4.260	5.62 lbs/ft	19

Schedule 40 Pipe

Nominal Pipe Size (in)	Nominal O.D. (in)	Nominal I.D. (in)	Weight/Ft	Bundle Size
1	1.315	1.049	1.68 lbs/ft	70
1 1/4	1.660	1.380	2.27 lbs/ft	51
1 1/2	1.900	1.610	2.72 lbs/ft	44
2	2.375	2.067	3.66 lbs/ft	30
2 1/2	2.875	2.468	5.80 lbs/ft	30
3	3.500	3.068	7.58 lbs/ft	19
4	4.500	4.026	10.80 lbs/ft	19

PIPE PREPARATION

For proper operation, all pipe surfaces should be cleaned prior to installation. In order to provide a leak-tight seat for the gasket, pipe surfaces should be free from indentations and projections from the end of the pipe to the groove. All loose paint, scale, dirt, chips, grease, and rust must be removed prior to installation. Failure to take these important steps may result in improper coupling assembly, causing leakage. Also, check the manufacturer's instructions for the specific fitting used.

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EDDY FLOW

Always ready to protect your most valuable assets.

As the leading supplier of steel sprinkler pipe, we understand that there are no second chances in fire suppression. You need products of enduring quality and exceptional strength–plus reliable service. You need Bull Moose.

Bull Moose Fire Sprinkler Pipe Product Information

Nominal Pipe Size (Inches)		1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
EDDY FLOW	O.D. (in)		1.660	1.900	2.375	2.875	3.500	4.500		
	I.D. (in)		1.530	1.728	2.203	2.705	3.334	4.310		
	Empty Weight (lb/ft)		1.222	1.844	2.330	2.809	3.361	4.968		
	Water Filled Weight (lb/ft)		2.019	2.860	3.982	5.299	7.144	11.290		
	C.R.R.		1.98	3.44	2.78	1.66	1.00	1.00		
	Pieces per Lift		61	61	37	30	19	19		
	Lift Weight (lbs) 21' lengths		1,565	2,362	1,810	1,770	1,341	1,982		
	Lift Weight (lbs) 24' lengths		1,789	2,700	2,069	2,022	1,533	2,265		
	Lift Weight (lbs) 25' lengths		1,864	2,812	2,155	2,107	1,596	2,360		

EDDY FLOW ADVANTAGES:

- UL listed (US & Canada) and FM approved
- ASTM A135 and A795 Type E, Grade A Certified
- Complies with NFPA-13, 13R and 14
- Industry-leading hydraulic characteristics
- CRR of 1.0 and greater
- All pipe NDT weld tested

OTHER BENEFITS/SERVICES:

- We have the most stocking locations in the industry, for best delivery and availability
- Plain end or roll groove
- Eddy Guard II™ bacterial-resistant internal coating
- Custom length options
- Hot dipped galvanization
- Reddi-Pipe® red or black pipe eliminates field painting
- Compatible for use in wet, dry, preaction and deluge sprinkler systems
- The only maker with EPDs (to help earn LEED points).

Exclusive maker of Reddi-Pipe®
RED OR BLACK PAINTED PIPE.

CERTIFIED ENVIRONMENTAL PRODUCT DECLARATION UL.COM/EPD

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FM APPROVED

NFPA

AFSA American Fire Sprinkler Association

NFSA The Voice of the Fire Sprinkler Industry

BULL MOOSE® TUBE

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BullMooseTube.com

MATERIAL SAFETY DATA SHEET

MSDS No. 001 Leaded Red Brass Pipe Fittings

PRODUCT IDENTITY: Brass Pipe Fittings Leaded Red Brass No. C83600 **MSDS No:** 001

SECTION 1 - Product and Company Identification

DISTRIBUTOR: Merit Brass Company MANUFACTURER: Various

EMERGENCY TELEPHONE NUMBER: 1-216-261-9800 or 1-800-726-9800

ADDRESS: One Merit Drive - P.O. Box 43127, Cleveland, Ohio 44143

TELEPHONE NUMBER FOR INFORMATION: 1-216-261-9800 or 1-800-726-9800

CHEMICAL NAME AND SYNONYMS: Brass Alloy Fittings ASTM B584-08a; CDA 836, SAE 40

COMPANY CONTACT: Thomas J. Golenski, Production Manager

SECTION 2 - Hazardous Ingredients

ELEMENT	CAS NO.	% RANGE	OSHA PEL (mg/M3)	ACGIH TLV (mg/M3)
Aluminum	7429-90-5	.005 Max	5 respirable dust, 15 total dust	1
Antimony	7440-36-0	.25	0.5	0.5
Copper	7440-50-8	84 to 86	0.1 fume, 1 dust	0.2 fume, 1 dust
Iron (as oxide)	7439-89-6	0.30	10 fume	5
Lead	7439-92-1	4 to 6	0.05	0.05
Nickel	7440-02-0	1 Max	1	1.5
Phosphorus (yellow)	12185-10-3	.05 Max	0.1	0.1
Silicon	7440-21-3	.005 Max	5 respirable dust, 15 total dust	10
Sulfur (as dust)	7704-34-9	.08 Max	5 respirable dust, 15 total dust	3 respirable dust, 10 total dust
Tin	7440-31-5	4 to 6	2	2
Zinc (as oxide)	7440-66-6	4 to 6	5 respirable dust, 15 total dust	2 fume, 10 total dust

SECTION 3 - Physical Data

MELTING POINT: 1500 to 2100° F

SPECIFIC GRAVITY: 7.5 to 9.0 g/cc

BOILING POINT: Not Applicable

VAPOR PRESSURE: Not Applicable

Brass is a shiny yellow-golden colored metallic solid, it has no odor, and is not soluable in water.

SECTION 3 - Fire & Explosion Data

FLASH POINT: Not Applicable

EXTINGUISHING MEDIA: Water spray or ABC dry chemical

AUTO-IGNITION TEMPERTURE: Not Applicable

NATIONAL FIRE PROTECTION ASSOCIATION DATA:

Health - 1 Flammability - 0

Reactivity - 1 Special - None

FLAMMABLE LIMITS: LEL N/A UEL N/A

SPECIAL FIRE FIGHTING PROCEDURES: None when solid.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Do not use water on molten metal.

SECTION 5 - Health Hazard Data

THRESHHOLD LIMIT VALUE: See SECTION 2 - HAZARDOUS INGREDIENTS

EFFECTS OF OVEREXPOSURE: No adverse health effects when handling intact parts; wash hands before eating to prevent ingestion of minute amounts of toxic metal that may accumulate in the body. Exposure to brass grinding dust and brazing fumes may cause the cold-like symptoms of metal fume fever; metallic taste in mouth, chills, fever, dry mouth and throat, headache. Copper fumes may cause the discoloration of skin and hair.

EMERGENCY AND FIRST AID PROCEDURES: In all cases seek medical assistance.

INHALATION - Remove person with symptoms to fresh air, thoroughly shower, and change cloths.

INGESTION - Seek medical assistance.

EYE - Flush with clean water for thirty minutes.

SKIN - Wash thoroughly with soap and water.

SECTION 6 - Reactivity Data

STABILITY: Brass metal is stable at room temperture.

INCOMPATABILITY: (Materials to avoid) Strong acids and bases.

HAZARDOUS DECOMPOSITION PRODUCTS: Flammable or toxic gases may evolve when brass is exposed to acids or bases.

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Do not use brass pipe and fittings to transport corrosive liquids.

SECTION 7 - Spill or Leak Procedures

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Brass parts spills should constitute only a trip and fall hazard.

WASTE DISPOSAL METHOD: Brass metal is valuable and may be recycled by foundries and secondary metal smelters. Avoid melting brass chips covered with metal cutting oil since this will cause fugative emmissions of dense smoke into the air.

SECTION 8 - Special Protection Information

RESPIRATORY PROTECTION: Use a NIOSH approved HEPA respirator when melting, brazing, or grinding brass metal. *(Specify type in accordance with the concentration of toxic particles in the air and work conditions.)*

VENTILATION: Local exhaust ventilation is recommended when melting, brazing, or grinding brass metal.

EYE PROTECTION: Wear appropriate eye protection when melting, brazing, soldering, cutting, or grinding brass metal.

PROTECTIVE GLOVES: Use cotton work glove to prevent transfer of metal to skin. Use cut resistant gloves when handling metal chips. Use heat resistant gloves or tongs to handle hot parts.

OTHER PROTECTIVE EQUIPMENT: Wear clothing appropriate to the fabrication operation attempted with this product.

SECTION 9 - Special Precautions

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Protect brass parts from moisture to avoid dicoloration and corrosion.

OTHER PRECAUTIONS: Never place wet brass parts into a melting furnace - explosion hazard.

MSDS prepared by: S.R. Pressman, Industrial Hygienist , Aniline Environmental (02/2012)

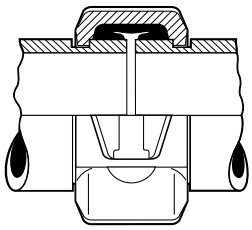
Flexible Coupling

STYLE 75

SEE VICTAULIC PUBLICATION 10.01 FOR DETAILS

Style 75 is available where moderate pressures are expected or weight considerations are a factor. Up to 50% lighter in weight than the Style 77, the Style 75 coupling is recommended for service up to 500 psi/3450 kPa depending on size. Housings are cast in two identical pieces in all sizes. Hot-dip galvanized and special coatings are available for all sizes.

The Victaulic standard flexible coupling offering for grade "EHP" or "T" gaskets is the Style 177 installation-ready flexible coupling. For all available sizes, the Style 177 is the standard flexible coupling Victaulic supplies in North America for piping systems using Grade "EHP" or "T" gaskets. Contact Victaulic for further details.



Exaggerated for clarity

MATERIAL SPECIFICATIONS

Housing: Ductile iron conforming to ASTM A-536, grade 65-45-12. Ductile iron conforming to ASTM A-395, grade 65-45-15, is available upon special request.

Housing Coating: Orange enamel.
- **Optional:** Hot dipped galvanized and others.

Gasket: (specify choice*)

- **Grade "E" EPDM**
  EPDM (Green color code). Temperature range –30°F to +230°F/–34°C to +110°C. Recommended for hot water service within the specified temperature range plus a variety of dilute acids, oil-free air and many chemical services. UL classified in accordance with ANSI/NSF 61 for cold +86°F/+30°C and hot +180°F/+82°C potable water service. NOT RECOMMENDED FOR PETROLEUM SERVICES.

- **Grade "T" nitrile**
  Nitrile (Orange color code). Temperature range –20°F to +180°F/–29°C to +82°C. Recommended for petroleum products, air with oil vapors, vegetable and mineral oils within the specified temperature range; except hot, dry air over +140°F/+60°C and water over +150°F/+66°C. NOT RECOMMENDED FOR HOT WATER SERVICES.

* Services listed are General Service Recommendations only. It should be noted that there are services for which these gaskets are not recommended. Reference should always be made to the latest Victaulic Gasket Selection Guide for specific gasket service recommendations and for a listing of services which are not recommended.

NOTE: Additional gasket styles are available. Contact Victaulic for details.

Bolts/Nuts: Heat-treated plated carbon steel, trackhead meeting the physical and chemical requirements of ASTM A-449 and physical requirements of ASTM A-183.

JOB/OWNER
System No. _____
Location _____

CONTRACTOR
Submitted By _____
Date _____

ENGINEER
Spec Sect _____ Para _____
Approved _____
Date _____

Flexible Coupling

STYLE 75

DIMENSIONS

Size		Max. Work Pressure *	Max. End Load *	Allow. Pipe End Sep. †	Deflect. Fr. C_L†		Bolt/Nut@ No – Size	Dimensions – Inches/mm			Approx. Wgt. Each
Nominal Size Inches mm	Actual Outside Diameter Inches mm	psi kPa	Lbs. N	Inches mm	Per Cplg. Deg.	Pipe In./Ft. mm/m	Inches	X	Y	Z	Lbs. kg
1 25	1.315 33.4	500 3450	680 3025	0 – 0.06 0 – 1.6	2° – 43′	0.57 48	2 – ⅜ x 2	2.38 61	4.27 108	1.77 45	1.3 0.6
1 ¼ 32	1.660 42.2	500 3450	1080 4805	0 – 0.06 0 – 1.6	2° – 10′	0.45 38	2 – ⅜ x 2	2.68 68	4.61 117	1.77 45	1.4 0.6
1 ½ 40	1.900 48.3	500 3450	1420 6320	0 – 0.06 0 – 1.6	1° – 56′	0.40 33	2 – ⅜ x 2	2.91 74	4.82 122	1.77 45	1.5 0.6
2 50	2.375 60.3	500 3450	2215 9860	0 – 0.06 0 – 1.6	1° – 31′	0.32 26	2 – ⅜ x 2	3.43 87	5.22 133	1.88 48	1.7 0.8
2 ½ 65	2.875 73.0	500 3450	3245 14440	0 – 0.06 0 – 1.6	1° – 15′	0.26 22	2 – ⅜ x 2	3.88 98	5.68 144	1.88 48	1.9 0.9
76.1 mm	3.000 76.1	500 3450	3535 15730	0 – 0.06 0 – 1.6	1° – 12′	0.26 22	2 – ⅜ x 2	4.00 102	5.90 150	1.88 48	1.9 0.9
3 80	3.500 88.9	500 3450	4800 21360	0 – 0.06 0 – 1.6	1° – 2′	0.22 18	2 – ½ x 2 ¾	4.50 114	7.00 178	1.88 48	2.9 1.3
3 ½ 90	4.000 101.6	500 3450	6300 28035	0 – 0.06 0 – 1.6	0° – 54′	0.19 16	2 – ½ x 2 ¾	5.00 127	7.50 191	1.88 48	2.9 1.3
4 100	4.500 114.3	500 3450	7950 35380	0 – 0.13 0 – 3.2	1° – 36′	0.34 28	2 – ½ x 2 ¾	5.80 147	8.03 204	2.13 54	4.1 1.9
108.0 mm	4.250 108.0	450 3100	6380 28395	0 – 0.13 0 – 3.2	1° – 41′	0.35 29	2 – 12 x 70.0	5.55 141	7.79 198	2.13 54	3.7 1.7
4 ½ 120	5.000 127.0	450 3100	8820 39250	0 – 0.13 0 – 3.2	1° – 26′	0.25 21	2 – ⅝ x 3 ¼	6.13 156	9.43 240	2.13 54	5.5 2.5
5 125	5.563 141.3	450 3100	10935 48660	0 – 0.13 0 – 3.2	1° – 18′	0.27 23	2 – ⅝ x 3 ¼	6.88 175	10.07 256	2.13 54	5.8 2.6
133.0 mm	5.250 133.0	450 3100	9735 43325	0 – 0.13 0 – 3.2	1° – 21′	0.28 24	2 – 16 x 82.5	6.55 166	9.37 238	2.13 54	6.0 2.7
139.7 mm	5.500 139.7	450 3100	10665 47460	0 – 0.13 0 – 3.2	1° – 18′	0.28 24	2 – ⅝ x 3 ¼	6.80 173	9.59 244	2.13 54	6.3 2.9
152.4 mm	6.000 152.4	450 3100	12735 56670	0 – 0.13 0 – 3.2	1° – 12′	0.21 18	2 – ⅝ x 3 ¼	7.38 187	10.48 266	1.88 48	6.2 2.8
6 150	6.625 168.3	450 3100	15525 69085	0 – 0.13 0 – 3.2	1° – 5′	0.23 18	2 – ⅝ x 3 ¼	8.00 203	11.07 281	2.13 54	7.0 3.2
159.0 mm	6.250 159.0	450 3100	13800 61405	0 – 0.13 0 – 3.2	1° – 9′	0.24 20	2 – 16 x 82.5	7.63 194	10.49 266	2.13 54	6.8 3.1
8 200	8.625 219.1	450 3100	26280 116945	0 – 0.13 0 – 3.2	0° – 50′	0.18 14	2 – ¾ x 4 ¼	10.34 263	13.97 355	2.32 59	12.4 5.6

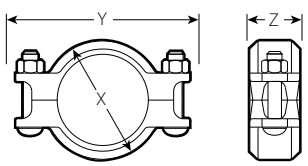
* Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

WARNING: FOR ONE TIME FIELD TEST ONLY, the Maximum Joint Working Pressure may be increased to 1 1/2 times the figures shown.

† Allowable Pipe End Separation and Deflection figures show the maximum nominal range of movement available at each joint for standard roll grooved pipe. Figures for standard cut grooved pipe may be doubled. These figures are maximums; for design and installation purposes these figures should be reduced by: 50% for ¾ – 3 1/2″/20 – 90 mm; 25% for 4″/100 mm and larger.

@ Number of bolts required equals number of housing segments.

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



Flexible Coupling

STYLE 75

WARRANTY

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

NOTE

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

INSTALLATION

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

06.05 1470 REV M UPDATED 2/2011

FireLock® Fittings

See Victaulic publication 10.01 for details

FireLock® products comprise a unique system specifically designed for fire protection services. FireLock full-flow elbows and tees feature CAD-developed, hydrodynamic design, affording a shorter center-to-end dimension than standard fittings. A noticeable bulge allows the water to make a smoother turn to maintain similar flow characteristics as standard full flow fittings.

FireLock fittings are designed for use exclusively with Victaulic IPS-sized couplings that have been Listed or Approved for Fire Protection Services. Use of other couplings or flange adapters may result in bolt pad interference.

Victaulic FireLock fittings pressure ratings conform to the ratings of Victaulic FireLock EZ® Style 009N/Style 009H couplings.

MATERIAL SPECIFICATIONS

Fitting: Ductile iron conforming to ASTM A-536, grade 65-45-12.

Fitting Coating:

- Orange enamel.
- Red Enamel in EMEA-I.
- **Optional:** Hot dipped galvanized.

JOB/OWNER

System No. _____

Location _____

CONTRACTOR

Submitted By _____

Date _____

ENGINEER

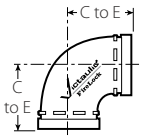
Spec Sect _____ Para _____

Approved _____

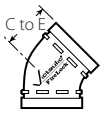
Date _____

FireLock® Fittings

DIMENSIONS



NO. 001



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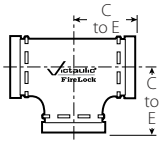


NO. 002

NO. 006

Size		No. 001 90° Elbow		No. 003 45° Elbow		No. 002 Straight Tee		No. 006 Cap	
Nominal Size Inches mm	Actual Outside Diameter Inches mm	C to E Inches mm	Approx. Weight Each Lbs. kg	C to E Inches mm	Approx. Weight Each Lbs. kg	C to E Inches mm	Approx. Weight Each Lbs. kg	Thickness "T" Inches mm	Approx. Weight Each Lbs. kg
1 ¼ 32	1.660 42.4	—	—	—	—	—	—	0.8 21	0.3 0.1
1 ½ 40	1.900 48.3	— —	— —	— —	— —	— —	— —	0.82 21	0.4 0.2
2 50	2.375 60.3	2.75 70	1.7 0.8	2.00 51	1.8 0.8	2.75 70	2.4 1.1	0.88 22	0.6 0.3
2 ½ 65	2.875 73.0	3.00 76	3.1 1.4	2.25 57	2.2 1.0	3.00 76	3.6 1.6	0.88 22	1.0 0.5
76.1 mm	3.000 76.1	3.00 76	3.30 1.5	2.25 57	2.4 1.1	—	—	—	—
3 80	3.500 88.9	3.38 86	4.0 1.8	2.50 64	3.1 1.4	3.38 86	5.3 2.4	0.88 22	1.2 0.5
108 mm	4.250 108.0	4.00 102	5.7 2.6	3.00 76	5.1 2.3	4.00 102	7.5 3.4	—	—
4 100	4.500 114.3	4.00 102	6.7 3.0	3.00 76	5.6 2.5	4.00 102	8.7 3.9	1.00 25	2.4 1.1
5 125	5.563 141.3	4.88 124	12.6 5.7	3.25 83	8.3 3.8	4.88 124	15.7 7.1	1.00 25	4.1 1.9
159 mm	6.250 158.8	5.50 140	12.6 5.7	3.50 89	9.2 4.2	5.50 140	17.9 8.0	—	—
6 150	6.625 168.3	5.50 140	18.3 8.3	3.50 89	11.7 5.3	5.50 140	22.7 10.3	1.00 25	5.9 2.7
8 200	8.625 219.1	6.81 173	25.5 11.6	4.25 108	20.4 9.3	6.94 176	38.7 17.6	1.13 29	12.7 5.8

FireLock® Fittings

FLOW DATA

Size		Frictional Resistance Equivalent Feet/meters of Straight Pipe †			
		Elbows		No. 002 Straight Tee	
Nominal Size Inches mm	Actual Outside Diameter Inches mm	No. 001 90° Elbow	No. 003 45° Elbow	Branch	Run
1 ¼ 32	1.660 42.4	— —	— —	— —	— —
1 ½ 40	1.900 48.3	— —	— —	— —	— —
2 50	2.375 60.3	3.5 1.1	1.8 0.5	8.5 2.6	3.5 1.1
2 ½ 65	2.875 73.0	4.3 1.3	2.2 0.7	10.8 3.3	4.3 1.3
76.1 mm	3.000 76.1	4.5 1.4	2.3 0.7	11.0 3.4	4.5 1.4
3 80	3.500 88.9	5.0 1.5	2.6 0.8	13.0 4.0	5.0 1.5
108 mm	4.250 108.0	6.4 2.0	3.2 0.9	15.3 4.7	6.4 2.0
4 100	4.500 114.3	6.8 2.1	3.4 1.0	16.0 4.9	6.8 2.1
5 125	5.563 141.3	8.5 2.6	4.2 1.3	21.0 6.4	8.5 2.6
159 mm	6.250 158.8	9.4 2.9	4.9 1.5	25.0 7.6	9.6 2.9
6 150	6.625 168.3	10.0 3.0	5.0 1.5	25.0 7.6	10.0 3.0
8 200	8.625 219.1	13.0 4.0	5.0 1.5	33.0 10.1	13.0 4.0

† The flow data listed is based upon the pressure drop of Schedule 40 pipe.

FireLock® Fittings

GENERAL NOTES

NOTE: When assembling FireLock EZ couplings onto end caps, take additional care to make certain the end cap is fully seated against the gasket end stop. For FireLock EZ Style 009N/009H couplings, use FireLock No. 006 end caps containing the “EZ” marking on the inside face or No. 60 end caps containing the “QV EZ” marking on the inside face. Non-Victaulic end cap products shall not be used with Style 009/009V/009H couplings.

WARRANTY

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

NOTE

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

45° ELBOW

SPF/ANVIL

ANVILStar
Fire Products Division of Anvil International

Ductile Iron

MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.

Ductile iron per ASTM A536 Class 65-45-12.

Dimensions conform to ASME B16.14

Threads are NPT per ANSI/ASME B1.20.1.

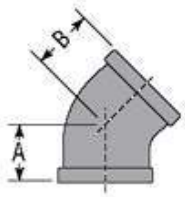
NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

UL FM ULC
APPROVED

For Listing/Approval Details and Limitations visit our Web Site *www.anvilintl.com* or contact an Anvil®/AnvilStar™ Sales Representative.

45° ELBOW

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions		Approx. Wt. Each
				A	B	
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	Lbs. (kg)
1 25	840002133	DB45033	500 3450	1.12 28.44	1.12 28.44	0.46 0.21
1¼ 32	840002141	DB45044	500 3450	1.29 32.76	1.29 32.76	0.73 0.33
1½ 40	840002158	DB45055	500 3450	1.43 36.32	1.43 36.32	0.92 0.42
2 50	840002166	DB45066	500 3450	1.68 42.67	1.68 42.67	1.50 0.68



* UL, ULC & FM Pressure Ratings

For additional listings and approvals, see the technical data section.

90° ELBOW

ANVILStar™
Fire Products Division of Anvil International

SPF/ANVIL

Ductile Iron

MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.

Ductile iron per ASTM A536 Class 65-45-12.

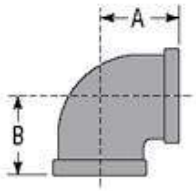
Dimensions conform to ASME B16.14

Threads are NPT per ANSI/ASME B1.20.1.

NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

UL FM ULC
APPROVED

For Listing/Approval Details and Limitations visit our Web Site *www.anvilintl.com* or contact an Anvil®/AnvilStar™ Sales Representative.



90° ELBOW						
Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions		Approx. Wt. Each
				A	B	
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	Lbs. (kg)
1 20	840000004	DB90033	500 3450	1.50 38.10	1.50 38.10	0.62 0.28
1¼ 32	840000012	DB90044	500 3450	1.75 44.45	1.75 44.45	0.90 0.41
1½ 40	840000020	DB90055	500 3450	1.94 49.276	1.94 49.276	1.20 0.54
2 50	840000038	DB90066	500 3450	2.25 57.15	2.25 57.15	1.85 0.84

* UL, ULC & FM Pressure Ratings

For additional listings and approvals, see the technical data section.

BULL HEAD TEE

ANVILSTAR
Fire Products Division of Anvil International

SPF/ANVIL

Ductile Iron

MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.

Ductile iron per ASTM A536 Class 65-45-12.

Dimensions conform to ASME B16.14

Threads are NPT per ANSI/ASME B1.20.1.

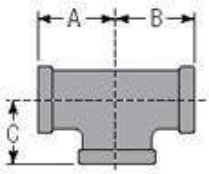
NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

APPROVED

For Listing/Approval Details and Limitations visit our Web Site *www.anvilintl.com* or contact an Anvil®/AnvilStar™ Sales Representative.

BULL HEAD TEE

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions			Approx. Wt. Each
				A	B	C	
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	In. (mm)	Lbs. (kg)
1 x 1 x 1¼ 25 x 25 x 32	840004238	DT334	500 3450	1.67 42.41	1.67 42.41	1.58 40.13	0.98 0.44
1 x 1 x 1½ 25 x 25 x 40	840004246	DT335	500 3450	1.80 45.72	1.80 45.72	1.65 41.91	1.16 0.53
1¼ x 1 x 1½ 32 x 25 x 40	840004295	DT435	500 3450	1.88 47.75	1.80 45.72	1.82 46.22	1.42 0.64
1¼ x 1¼ x 1½ 32 x 32 x 40	840004337	DT445	500 3450	1.88 47.75	1.88 47.75	1.82 46.22	1.45 0.66
1¼ x 1¼ x 2 32 x 32 x 50	840004345	DT446	500 3450	2.10 53.34	2.10 53.34	1.90 48.26	1.75 0.79
1½ x 1¼ x 2 40 x 32 x 50	840004436	DT546	500 3450	2.16 54.86	2.10 53.34	2.02 51.30	1.90 0.86
1½ x 1½ x 2 40 x 40 x 50	840004485	DT556	500 3450	2.16 54.86	2.16 54.86	2.02 51.30	1.98 0.90



* UL, ULC & FM Pressure Ratings

For additional listings and approvals, see the technical data section.

BUSHINGS

SPF/ANVIL

ANVILStar™
Fire Products Division of Anvil International

Ductile Iron

MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.

Ductile iron per ASTM A536 Class 65-45-12.

Dimensions conform to ASME B16.14

Threads are NPT per ANSI/ASME B1.20.1.

NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

UL FM ULC
APPROVED

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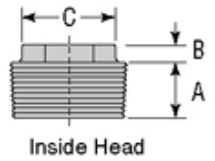
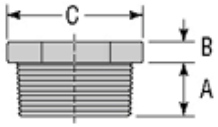
BUSHINGS							
Nominal Size	Anvil Item Number	Universal Number	Dimensions			Style	Approx. Wt. Each
			A	B	C		
In. (mm)			*In. (mm)*	*In. (mm)*	*In. (mm)*		*Lbs. (kg)*
1 x ⅜ *25 x 15*	840600001	DBUSH31	0.75 *19.05*	0.25 *6.35*	1.42 *36.06*	Outside	0.22 *0.10*
1 x ¾ *25 x 20*	840600019	DBUSH32	0.75 *19.05*	0.25 *6.35*	1.42 *36.06*	Outside	0.17 *0.08*
1¼ x 1 *32 x 25*	840600027	DBUSH43	0.80 *20.32*	0.28 *7.11*	1.76 *44.70*	Outside	0.28 *0.13*
1½ x 1 *40 x 25*	840600035	DBUSH53	0.83 *21.08*	0.31 *7.874*	2.00 *50.80*	Outside	0.45 *0.20*
1½ x 1¼ *40 x 32*	840600043	DBUSH54	0.83 *21.08*	0.31 *7.874*	2.00 *50.80*	Outside	0.30 *0.14*
2 x 1 *50 x 25*	840600050	DBUSH63	0.88 *22.35*	0.41 *10.414*	1.95 *49.53*	Inside	0.67 *0.30*
2 x 1¼ *50 x 32*	840600068	DBUSH64	0.88 *22.35*	0.34 *8.636*	2.48 *62.99*	Outside	0.73 *0.33*
2 x 1½ *50 x 40*	840600076	DBUSH65	0.88 *22.35*	0.34 *8.636*	2.48 *62.99*	Outside	0.61 *0.28*



Inside Head



Outside Head

CAP

SPF/ANVIL

ANVILStar
Fire Products Division of Anvil International

Ductile Iron

MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.

Ductile iron per ASTM A536 Class 65-45-12.

Dimensions conform to ASME B16.14

Threads are NPT per ANSI/ASME B1.20.1.

NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.

UL FM ULC
APPROVED

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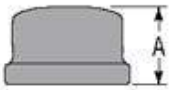
CAP

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions A	Approx. Wt. Each
In. (mm)			*PSI (kPa)*	*In. (mm)*	*Lbs. (kg)*
1 *25*	840005615	DCP003	500 *3450*	1.16 *29.46*	0.32 *0.15*
1¼ *32*	840005623	DCP004	500 *3450*	1.28 *32.51*	0.43 *0.20*
1½ *40*	840005631	DCP005	500 *3450*	1.33 *33.78*	0.60 *0.27*
2 *50*	840005649	DCP006	500 *3450*	1.45 *36.83*	0.91 *0.41*



* UL, ULC & FM Pressure Ratings

For additional listings and approvals, see the technical data section.

COUPLING

SPF/ANVIL

AnvilStar™
Fire Products Division of Anvil International

Ductile Iron

MATERIAL SPECIFICATIONS

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UL FM ULC
APPROVED

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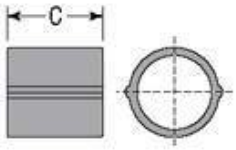
COUPLING

Nominal Size	Anvil Item Number	Universal Number	Dimensions A	Approx. Wt. Each
In. (mm)			In. (mm)	Lbs. (kg)
1 25	840008692	DQ033	1.67 42.42	0.40 0.18
1¼ 32	840008700	DQ044	1.93 49.02	0.57 0.26
1½ 40	840008718	DQ055	2.15 54.61	0.75 0.34
2 50	840008726	DQ066	2.53 64.26	1.15 0.52

For additional listings and approvals, see the technical data section.



CROSS

SPF/ANVIL

ANVILStar
Fire Products Division of Anvil International

Ductile Iron

MATERIAL SPECIFICATIONS

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UL FM ULC
APPROVED

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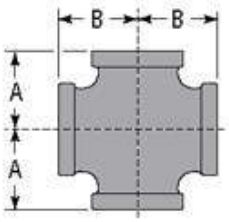

CROSS						
Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions		Approx. Wt. Each
				A	B	
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	Lbs. (kg)
1 25	840006647	DX033	500 3450	1.50 38.10	1.50 38.10	0.98 0.44
1¼ 32	840006654	DX044	500 3450	1.75 44.45	1.75 44.45	1.50 0.68
1½ 40	840006662	DX055	500 3450	1.94 49.27	1.94 49.27	1.90 0.86
2 50	840006670	DX066	500 3450	2.25 57.15	2.25 57.15	2.95 1.34
1¼ x 1 32 x 25	840007678	DX043	500 3450	1.58 40.13	1.67 42.41	1.27 0.58
1½ x 1 40 x 25	840007686	DX053	500 3450	1.65 41.91	1.80 45.72	1.48 0.67
2 x 1 50 x 25	840007694	DX063	500 3450	1.73 43.94	2.02 51.30	2.10 0.95

* UL, ULC & FM Pressure Ratings

For additional listings and approvals, see the technical data section.

REDUCING 90° ELBOW

ANVILSTAR™
Fire Products Division of Anvil International

SPF/ANVIL®

Ductile Iron

MATERIAL SPECIFICATIONS

Ductile iron threaded fittings are UL & ULC Listed & Factory Mutual Approved for 500 psi service.

Ductile iron per ASTM A536 Class 65-45-12.

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UL FM ULC
APPROVED

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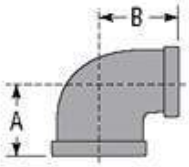

REDUCING 90° ELBOW

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions		Approx. Wt. Each
				A	B	
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	Lbs. (kg)
1 x ⅜ 25 x 15	840001036	DB90031	500 3450	1.26 32.00	1.36 34.54	0.44 0.20
1 x ¾ 25 x 20	840001044	DB90032	500 3450	1.37 34.79	1.45 36.83	0.52 0.24
1¼ x ½ 32 x 15	840001051	DB90041	500 3450	1.34 34.03	1.53 38.86	0.64 0.29
1¼ x ¾ 32 x 20	840001069	DB90042	500 3450	1.45 36.83	1.62 41.14	0.72 0.33
1¼ x 1 32 x 25	840001077	DB90043	500 3450	1.58 40.13	1.67 42.41	0.75 0.34
1½ x 1 40 x 25	840001085	DB90053	500 3450	1.65 41.91	1.80 45.72	0.92 0.42
1½ x 1¼ 40 x 32	840001093	DB90054	500 3450	1.82 46.22	1.88 47.75	1.08 0.49
2 x ⅜ 50 x 15	840001101	DB90061	500 3450	1.49 37.84	1.88 47.75	1.08 0.49
2 x ¾ 50 x 20	840001119	DB90062	500 3450	1.60 40.64	1.97 50.03	1.24 0.56
2 x 1 50 x 25	840001127	DB90063	500 3450	1.73 43.94	2.02 51.30	1.40 0.64
2 x 1¼ 50 x 32	840001135	DB90064	500 3450	1.90 48.26	2.10 53.34	1.52 0.70
2 x 1½ 50 x 40	840001143	DB90065	500 3450	2.02 51.30	2.16 54.86	1.65 0.75

* UL, ULC & FM Pressure Ratings

For additional listings and approvals, see the technical data section.

REDUCING COUPLING

SPF/ANVIL

AnvilStar
Fire Products Division of Anvil International

Ductile Iron

MATERIAL SPECIFICATIONS

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Ductile iron per ASTM A536 Class 65-45-12.

Dimensions conform to ASME B16.14

Threads are NPT per ANSI/ASME B1.20.1.

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UL FM ULC
APPROVED

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REDUCING COUPLING

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions A	Approx. Wt. Each
In. (mm)			*PSI (kPa)*	*In. (mm)*	*Lbs. (kg)*
1 x ⅜ *25 x 15*	840010755	DRC031	500 *3450*	1.69 *42.92*	0.39 *0.18*
1 x ¼ *25 x 20*	840010763	DRC032	500 *3450*	1.69 *42.92*	0.53 *0.24*

* UL, ULC & FM Pressure Ratings

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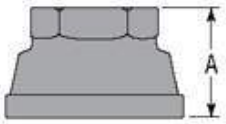
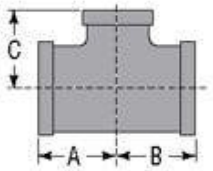


REDUCING TEE

ANVILSTAR™
Fire Products Division of Anvil International

SPF/ANVIL®

Ductile Iron



MATERIAL SPECIFICATIONS

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Ductile iron per ASTM A536 Class 65-45-12.

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APPROVED

* UL, ULC & FM Pressure Ratings

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REDUCING TEE

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions			Approx. Wt. Each
				A	B	C	
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	In. (mm)	Lbs. (kg)
1 x ½ x 1 25 x 15 x 25	840004196	DT313	500 3450	1.50 38.10	1.36 34.54	1.50 38.10	0.64 0.29
1 x ¾ x 1 25 x 20 x 25	840004204	DT323	500 3450	1.50 38.10	1.45 36.83	1.50 38.10	0.73 0.33
1 x 1 x ½ 25 x 25 x 15	840004212	DT331	500 3450	1.26 32.00	1.26 32.00	1.36 34.54	0.71 0.32
1 x 1 x ¾ 25 x 25 x 20	840004220	DT332	500 3450	1.37 34.80	1.37 34.80	1.45 36.83	0.76 0.34
1 x 1 x 1¼ 25 x 25 x 32	840004238	DT334	500 3450	1.67 42.41	1.67 42.41	1.58 40.13	0.98 0.44
1 x 1 x 1½ 25 x 25 x 40	840004246	DT335	500 3450	1.80 45.72	1.80 45.72	1.65 41.91	1.16 0.53
1¼ x 1 x ½ 32 x 25 x 15	840004253	DT431	500 3450	1.34 34.04	1.26 32.00	1.53 38.86	0.82 0.37
1¼ x 1 x ¾ 32 x 25 x 20	840004261	DT432	500 3450	1.45 36.83	1.37 34.80	1.62 41.15	0.90 0.41
1¼ x 1 x 1 32 x 25 x 25	840004279	DT433	500 3450	1.58 40.13	1.50 38.10	1.67 42.42	1.00 0.45
1¼ x 1 x 1¼ 32 x 25 x 32	840004287	DT434	500 3450	1.75 44.45	1.67 42.42	1.75 44.45	1.08 0.49
1¼ x 1 x 1½ 32 x 25 x 40	840004295	DT435	500 3450	1.88 47.75	1.80 45.72	1.82 46.22	1.42 0.64
1¼ x 1¼ x ½ 32 x 32 x 15	840004303	DT441	500 3450	1.34 34.04	1.34 34.04	1.53 38.86	0.86 0.39
1¼ x 1¼ x ¾ 32 x 32 x 20	840004311	DT442	500 3450	1.45 36.83	1.45 36.83	1.62 41.15	0.92 0.42
1¼ x 1¼ x 1 32 x 32 x 25	840004329	DT443	500 3450	1.58 40.13	1.58 40.13	1.67 42.42	0.95 0.43
1¼ x 1¼ x 1½ 32 x 32 x 40	840004337	DT445	500 3450	1.88 47.75	1.88 47.75	1.82 46.22	1.45 0.66
1¼ x 1¼ x 2 32 x 32 x 50	840004345	DT446	500 3450	2.10 53.34	2.10 53.34	1.90 48.26	1.75 0.79
1½ x 1 x ½ 40 x 25 x 15	840004352	DT531	500 3450	1.41 35.81	1.34 34.04	1.66 42.16	0.95 0.43
1½ x 1 x ¾ 40 x 25 x 20	840004360	DT532	500 3450	1.52 38.61	1.37 34.80	1.75 44.45	1.14 0.52
1½ x 1 x 1 40 x 25 x 25	840004378	DT533	500 3450	1.65 41.91	1.50 38.10	1.80 45.72	1.17 0.53
1½ x 1 x 1¼ 40 x 25 x 32	840004386	DT534	500 3450	1.82 46.23	1.67 42.42	1.88 47.75	1.34 0.61
1½ x 1 x 1½ 40 x 25 x 40	840004394	DT535	500 3450	1.94 49.28	1.80 45.72	1.94 49.28	1.45 0.66
1½ x 1¼ x ½ 40 x 32 x 15	840004402	DT541	500 3450	1.41 35.81	1.34 34.04	1.66 42.16	1.05 0.48
1½ x 1¼ x ¾ 40 x 32 x 20	840004410	DT542	500 3450	1.52 38.61	1.45 36.83	1.75 44.45	1.15 0.5
1½ x 1¼ x 1 40 x 32 x 25	840004428	DT543	500 3450	1.65 41.91	1.58 40.13	1.80 45.72	1.25 0.57

REDUCING TEE

Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions			Approx. Wt. Each
				A	B	C	
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	In. (mm)	Lbs. (kg)
1½ x 1¼ x 2 40 x 32 x 50	840004436	DT546	500 3450	2.16 54.86	2.10 53.34	2.02 51.30	1.90 0.86
1½ x 1½ x ½ 40 x 40 x 15	840004444	DT551	500 3450	1.41 35.81	1.41 35.81	1.16 29.46	1.15 0.52
1½ x 1½ x ¾ 40 x 40 x 20	840004451	DT552	500 3450	1.52 38.61	1.52 38.61	1.75 44.45	1.24 0.56
1½ x 1½ x 1 40 x 40 x 25	840004469	DT553	500 3450	1.65 41.91	1.65 41.91	1.80 45.72	1.30 0.59
1½ x 1½ x 1¼ 40 x 40 x 32	840004477	DT554	500 3450	1.82 46.23	1.82 46.23	1.88 47.75	1.48 0.67
1½ x 1½ x 2 40 x 40 x 50	840004485	DT556	500 3450	2.16 54.86	2.16 54.86	2.02 51.30	1.98 0.90
2 x 1 x 2 50 x 25 x 50	840004493	DT636	500 3450	2.25 57.15	2.02 51.30	2.25 57.15	2.15 0.98
2 x 1¼ x 2 50 x 32 x 50	840004501	DT646	500 3450	2.25 57.15	2.10 53.34	2.25 57.15	2.30 1.04
2 x 1½ x ½ 50 x 40 x 15	840004519	DT651	500 3450	1.49 37.85	1.41 35.81	1.88 47.75	1.50 0.68
2 x 1½ x ¾ 50 x 40 x 20	840004527	DT652	500 3450	1.60 40.64	1.52 38.63	1.97 50.04	1.62 0.73
2 x 1½ x 1 50 x 40 x 25	840004535	DT653	500 3450	1.73 43.94	1.65 41.91	2.02 51.31	1.64 0.74
2 x 1½ x 1¼ 50 x 40 x 32	840004543	DT654	500 3450	1.90 48.26	1.82 46.23	2.10 53.34	1.80 0.82
2 x 1½ x 1½ 50 x 40 x 40	840004550	DT655	500 3450	2.02 51.31	1.94 49.28	2.16 54.86	2.00 0.91
2 x 1½ x 2 50 x 40 x 50	840004568	DT656	500 3450	2.25 57.15	2.16 54.86	2.25 57.15	2.35 1.07
2 x 2 x ½ 50 x 50 x 15	840004576	DT661	500 3450	1.49 37.85	1.49 37.85	1.88 47.75	1.60 0.73
2 x 2 x ¾ 50 x 50 x 20	840004584	DT662	500 3450	1.60 40.64	1.60 40.64	1.97 50.04	1.68 0.76
2 x 2 x 1 50 x 50 x 25	840004592	DT663	500 3450	1.73 43.94	1.73 43.94	2.02 51.31	1.85 0.84
2 x 2 x 1¼ 50 x 50 x 32	840004600	DT664	500 3450	1.90 48.45	1.90 42.47	2.10 44.45	2.04 0.93
2 x 2 x 1½ 50 x 50 x 40	840004618	DT665	500 3450	2.02 44.45	2.02 47.47	2.16 44.45	2.18 0.99
2 x 2 x 2½ 50 x 50 x 65	-	DT667	500 3450	2.60 44.45	2.60 42.42	2.39 44.45	3.61 1.64
2½ x 2 x ¾ 65 x 50 x 20	-	DT762	500 3450	1.74 44.45	1.60 42.42	2.32 44.45	2.28 1.03

STRAIGHT TEE

SPF/ANVIL

ANVILStar
Fire Products Division of Anvil International

Ductile Iron

MATERIAL SPECIFICATIONS

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UL ULC FM
APPROVED

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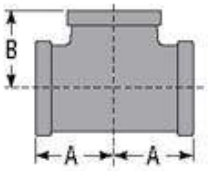
STRAIGHT TEE

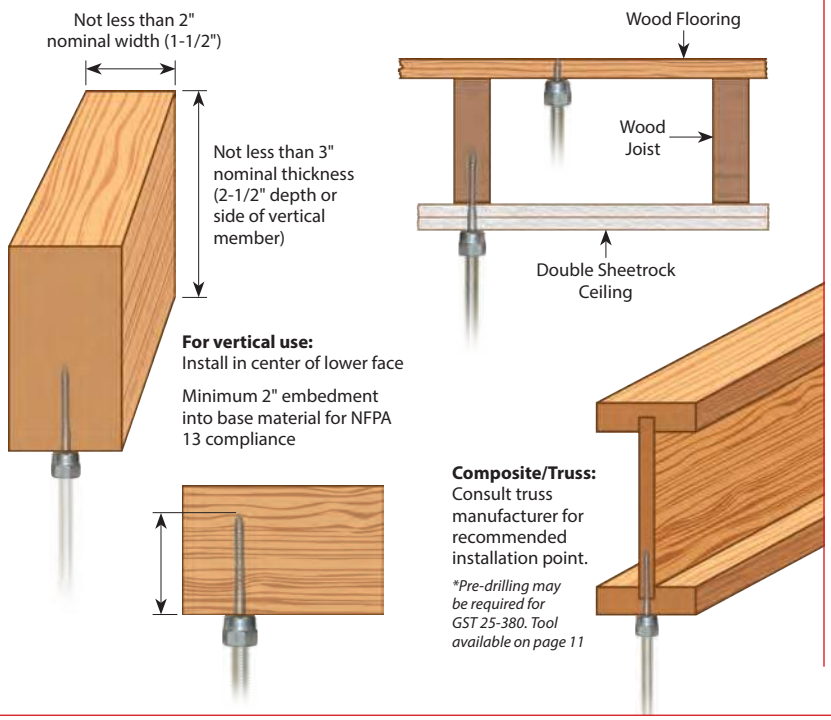
Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions		Approx. Wt. Each
				A	B	
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	Lbs. (kg)
1 25	840003164	DT333	500 3450	1.50 38.10	1.50 38.10	0.85 0.39
1¼ 32	840003172	DT444	500 3450	1.75 44.45	1.75 44.45	1.22 0.55
1½ 40	840003180	DT555	500 3450	1.94 49.27	1.94 49.27	1.55 0.70
2 50	840003198	DT666	500 3450	2.25 57.15	2.25 57.15	2.45 1.11



* UL, ULC & FM Pressure Ratings

For additional listings and approvals, see the technical data section.

SAMMYS FOR WOOD – Vertical Application



PRODUCT FEATURES

- No pre-drilling required
- Quick to install using the Sammy Nut Driver with an 18V cordless drill
- Saves time from traditional methods
- Reduces installation costs
- Assembled in the U.S.A.

View our installation videos:
www.sammysanchors.com/install

VERTICAL MOUNT

Approvals	Rod Size	Part Number	Model	Screw Description	Ultimate Pullout (lbs)	UL Test Load (lbs)	FM Test Load (lbs)	Box Qty	Case Qty	Nut Driver
	1/4"	8002957	GST 100	1/4 x 1"	210 (7/16" OSB) 760 (3/4" Ply)			25	125	#14 Black Part # 8113910
	1/4"	8003957	GST 200	1/4 x 2"	1760 (Fir)			25	125	#14 Black Part # 8113910
UL	3/8"	8007957	GST 10	1/4 x 1"	210 (7/16" OSB) 760 (3/4" Ply)	300		25	125	#14 Black Part # 8113910
UL FM	3/8"	8008957	GST 20	1/4 x 2"	1760 (Fir)	850	1475	25	125	#14 Black Part # 8113910
UL	3/8"	8068925	GST 20-SS*	1/4 x 2"	1760 (Fir)	850		25	125	#14 Black Part # 8113910
UL	3/8"	8009925	GST 25-380	3/8 x 2-1/2"	2113 (Fir)	1500		25	125	#14 Black Part # 8113910
UL FM	3/8"	8010957	GST 30	1/4 x 3"	2060 (Fir)	1500	1475	25	125	#14 Black Part # 8113910
	1/2"	8013925	GST 2	1/4 x 2"	1760 (Fir)			25	125	#14 SW Red Part # 8114910
	1/2"	8015925	GST 3	1/4 x 3"	2275 (Fir)			25	125	#14 SW Red Part # 8114910

* GST-20-SS is Stainless Steel

SAMMYS NUT DRIVERS

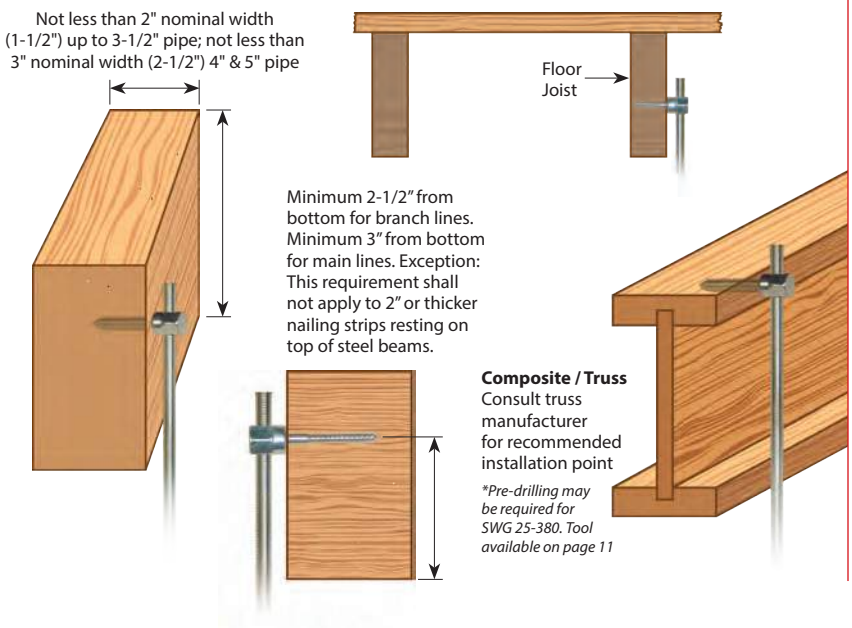

#14 Black Nut Driver
Part # 8113910


#14 SW Red Nut Driver
Part # 8114910


#14 SH Orange Nut Driver
Part # 8273910

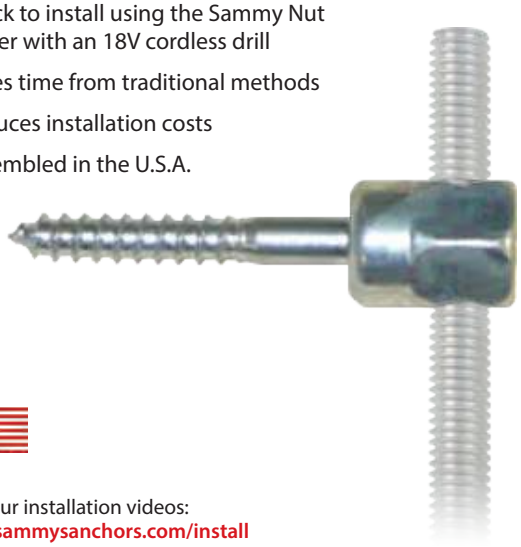
SPECIAL NUT DRIVER SYSTEM: The nut drivers were designed with a unique spin-off feature which provides a fast and safe installation each time. When the face of the driver comes into contact with the material you are installing into, continue drilling until nut driver spins free. Installation is then complete. Warranty requires the use of the appropriate nut driver for installations.

SIDEWINDER® FOR WOOD – Horizontal Application



PRODUCT FEATURES

- No pre-drilling required
- Quick to install using the Sammy Nut Driver with an 18V cordless drill
- Saves time from traditional methods
- Reduces installation costs
- Assembled in the U.S.A.



View our installation videos:
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HORIZONTAL MOUNT

Approvals	Rod Size	Part Number	Model	Screw Description	Ultimate Shear (lbs)	UL Test Load (lbs)	Box Qty	Case Qty	Nut Driver
cULus	3/8"	8020957	SWG 10	1/4 x 1"	622 (Fir)	300	25	125	#14 SW Red Part # 8114910
cULus	3/8"	8021957	SWG 20	1/4 x 2"	1725 (Fir)	1050	25	125	#14 SW Red Part # 8114910
cULus	3/8"	8022925	SWG 25-380	3/8 x 2-1/2"	2249 (Fir)	1500	25	125	#14 SW Red Part # 8114910
	3/8"	8023925	SWG 30	1/4 x 3"	1884 (Fir)	1500	25	125	#14 SW Red Part # 8114910

SAMMYS SWIVEL HEAD™ FOR WOOD – Swivel Application

PRODUCT FEATURES

- Eliminates distortion of threaded rod
- Accomodates up to 3½" x 12 pitch roof
- Saves time from traditional methods
- Reduces installation costs
- Assembled in the U.S.A.

View our installation videos:
www.sammysanchors.com/install

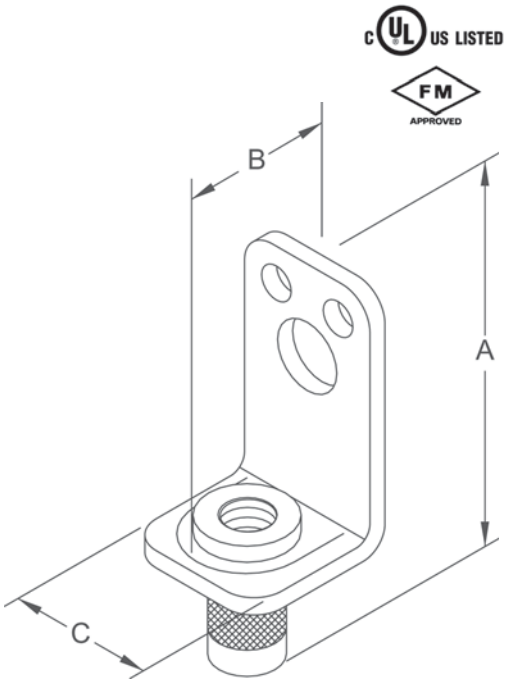
SWIVEL MOUNT

Approvals	Rod Size	Part Number	Model	Screw Description	Ultimate Pullout (lbs)	UL Test Load (lbs)	FM Test Load (lbs)	Max. Deflection	Box Qty	Case Qty	Nut Driver
cULus FM	3/8"	8139957	SH-GST 20	1/4 x 2"	1257 (Fir)	1050	1475	17°	25	125	#14 Black Part # 8113910
cULus	3/8"	8269957	SH-GST/CST 20	5/16 x 1-3/4"	1903 Dim. Lumber 1406 @ 45° off vertical Dim. Lumber	1500 850 @ 45°		89°	25	125	#14 SH Orange Part 8273910

*May require pre-drilling; consult joist manufacturer / **Will not swivel until installed with black nut driver

To find a distributor near you, call 800-848-5611

Fig. 58 - Threaded Side Beam Bracket



Size Range — 3/8" rod, pipe sizes 1/2" thru 4"

Material — Carbon Steel

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

Features — Unique design allows rod to be easily threaded into bracket. Offset design permits unlimited rod adjustment. Center mounting hole will accept 3/8" and 1/2" fastener bolts. Per NFPA 13: 1/2" thru 2" pipe requires 3/8" fastener, 2½" thru 4" pipe requires 1/2" fastener.*

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

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

Finish — Plain

Note — Available in Electro-Galvanized finish.

Order By — Figure number and finish

UL Listed Fastener Table

Pipe Size	Qty.	Fastener Type	Material
2	2	#16 x 2 Drive Screws	Wood
2	1	3/8 Lag Bolt	Wood
2½ - 4	1	1/2 Lag Bolt	Wood
3½	2	1/4 x 1½ Lag Bolt	Wood
4	2	1/4 x 2 Lag Bolts*	Wood
4	2	1/4 x 1 tek screws	14 gauge
4	2	1/4 x 1 tek screws	16 gauge

* No pre-drilling required

Dimensions • Weights

Pipe Size	Rod Size	A	B	C	Max. Rec. Load Lbs.*	Approx. Wt./100
1/2 thru 4	3/8	2¾	1½	1⅛	300	14

* With safety factor of 5.

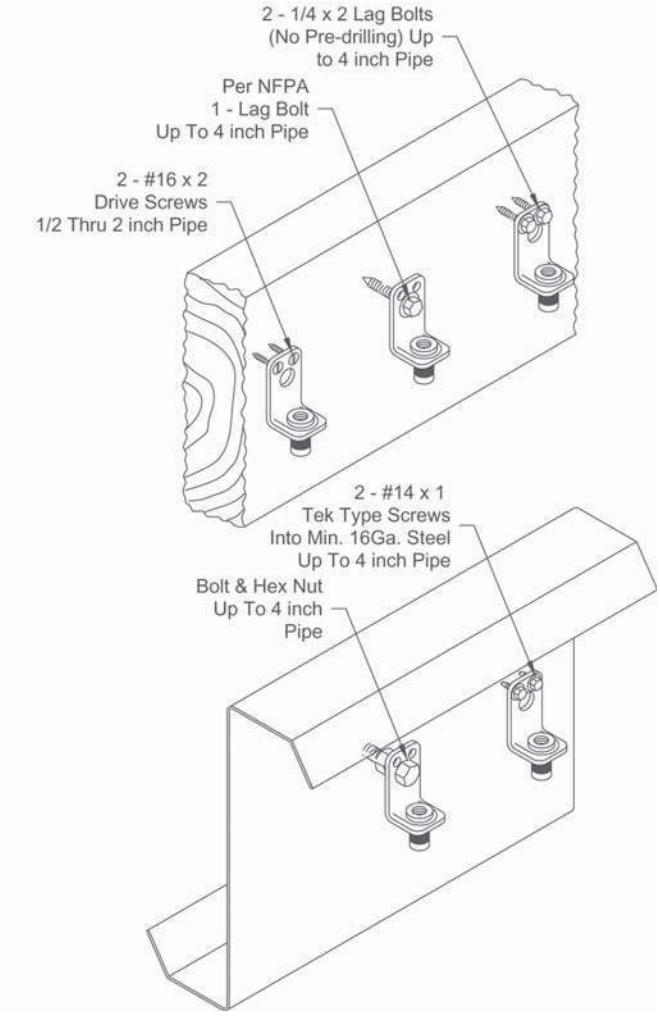


Fig. 98 - Rod Stiffener
Fig. 98B - Rod Stiffener w/Break-off Bolt Head

Component of State of California OSHPD Approved Seismic Restraints System

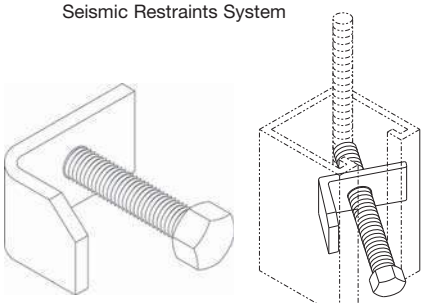


FIG. 98

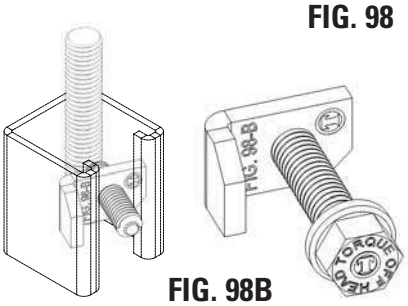


FIG. 98B

Size Range — Secures 3/8" thru 7/8" hanger rod

Material — Carbon Steel

Function — Secures channel to hanger rod for vertical seismic bracing.

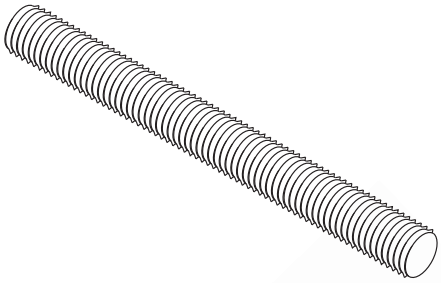
Approvals — Included in our Seismic Restraints Catalog approved by the State of California Office of Statewide Health Planning and Development (**OSHPD**). For additional load, spacing and placement information relating to OSHPD projects, please refer to the TOLCO Seismic Restraint Systems Guidelines

Finish — Electro Galvanized

Note — Available in HDG finish or Stainless Steel materials.

Order By — Figure number

Fig. 99 - All Thread Rod Cut to Length



Size Range — Secures 3/8" thru 7/8" rod in 1" increments

Material — Carbon Steel

Maximum Temperature — 750°F

Finish — Plain

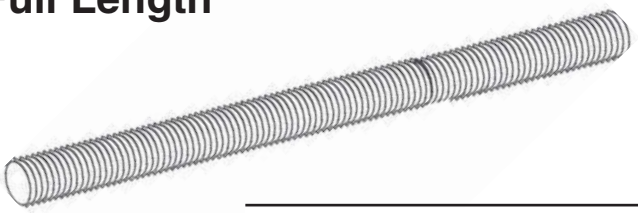
Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.

Order By — Figure number, rod diameter, rod length and finish

Dimensions

Rod Size	Max. Rec. Load Lbs. For Service Temp 650°F
3/8	730
1/2	1350
5/8	2160
3/4	3230
7/8	4480

Fig. 100 - All Thread Rod Full Length



Size Range — Secures 3/8" thru 1½" rod in 10' lengths

Material — Carbon Steel

Maximum Temperature — 750°F

Finish — Plain

Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.

Order By — Figure number, rod diameter and finish

Dimensions • Weights

Rod Size	Max Rec. Load Lbs. For Service Temps 650°F	Approx. Wt./100
1/4	240	12
3/8	730	29
1/2	1350	53
5/8	2160	84
3/4	3230	123
7/8	4480	169
1	5900	222
1¼	9500	360
1½	13800	510

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Fig. 200 - "Trimline" Adjustable Band Hanger
Fig. 200R (Import) - "Trimline" Adjustable Band Hanger w/Retainer Ring

c UL US LISTED
FM APPROVED

Size Range — 1/2" thru 8" pipe

Material — Carbon Steel, Mil. Galvanized to G90 specifications

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

Features —

- (1/2" thru 2") Flared edges ease installation for all pipe types and protect CPVC plastic pipe from abrasion. Captured design keeps adjusting nut from separating with hanger. Hanger is easily installed around pipe.
- (2½" thru 8") Spring tension on nut holds it securely in hanger before installation. Adjusting nut is easily removed.

Approvals — Underwriters' Laboratories listed (1/2" thru 8") in the USA **(UL)** and Canada **(cUL)** for steel and CPVC plastic pipe and Factory Mutual Engineering Approved (3/4" thru 8"). Conforms to Federal Specifications WW-H-171E, Type 10 and Manufacturers Standardization Society SP-69, Type 10.

Maximum Temperature — 650°F

Finish — Mil. Galvanized. Stainless Steel materials will be supplied with (2) hex nuts in place of a knurl nub.

Order By — Figure number and pipe size

Note — Figure 200R (import) with retainer ring and non-captured knurl nut.

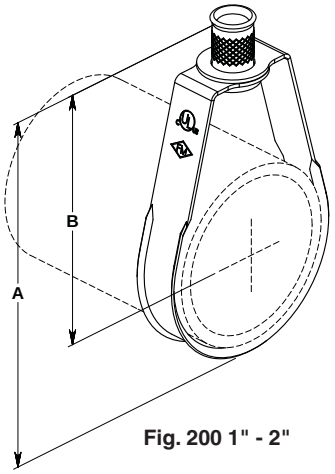


Fig. 200 1" - 2"

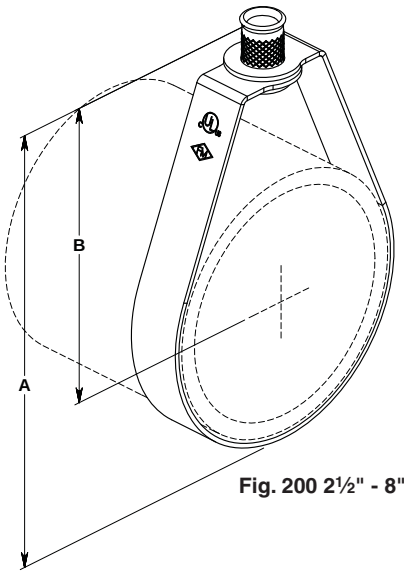


Fig. 200 2½" - 8"

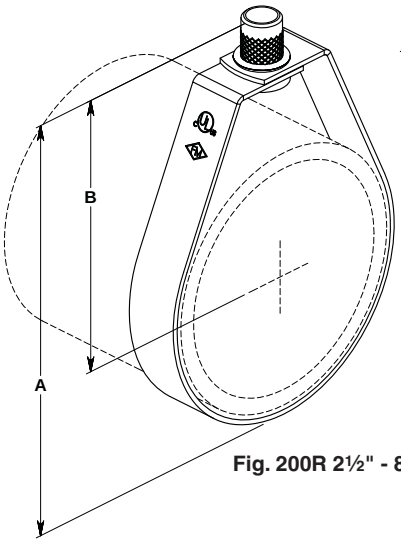


Fig. 200R 2½" - 8"

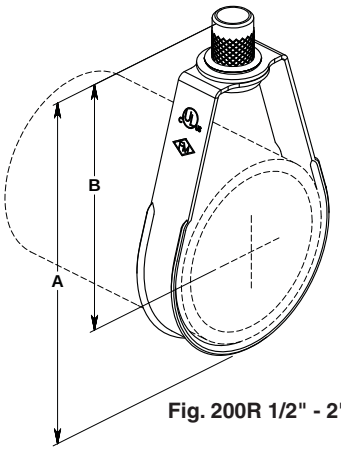


Fig. 200R 1/2" - 2"

Dimensions • Weights

Pipe Size	Rod Size Inch	Rod Size Metric	A	B	Max. Rec. Load Lbs.	Approx. Wt./100
1/2	3/8	8mm or 10mm	3⅛	2⅝	400	11
3/4	3/8	8mm or 10mm	3⅛	2½	400	11
1	3/8	8mm or 10mm	3⅜	2⅝	400	12
1¼	3/8	8mm or 10mm	3¾	2⅞	400	13
1½	3/8	8mm or 10mm	3⅞	2⅞	400	14
2	3/8	8mm or 10mm	4½	3	400	15
2½	3/8	10mm	5⅝	4⅛	600	27
3	3/8	10mm	5⅞	4	600	29
3½	3/8	10mm	7⅜	5¼	600	34
4	3/8	10mm	7⅜	5	1000	35
5	1/2	12mm	9⅛	6¼	1250	66
6	1/2	12mm	10⅛	6¾	1250	73
8	1/2	12mm	13⅛	8¾	1250	136

APPROVALS

Part Number	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
SAMMYS FOR WOOD - PIPE HANGER									
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"			
8269957	SH-GST/CST 20	3/8"	45° Angle off Vertical	2-1/2"	850	1-1/2"			
8269957	SH-GST/CST 20	3/8"	45° Angle off Vertical	4"	1500	1-1/2"			
8139957	SH-GST 20	3/8"	17° Angle off Vertical	3"	1050	1-1/2"	4"	1475	1-1/2"
SAMMYS FOR STEEL - PIPE HANGER						**Min Steel Thick**			**Max Steel Thick**
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"
8268957	SH-TEK 50	3/8"	Vertical 70° Angle off Vertical	2-1/2" 4"	850 1500				
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" .125"
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									
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/ft^3)			

Part Number	Model	Rod Size	Mount Direction	UL Load Rating (lbs)	UL Min Steel Thickness
SAMMYS FOR STEEL - LUMINAIRE FITTING					
8150922	XP 20	3/8"	Vertical	185 250	.027" .035"
8153922	XP 35	3/8"	Vertical	185 250	.027" .035"
8181922	XP 200	1/4"	Vertical	185 250	.027" .035"
8294922	SXP 20	3/8"	Vertical 45°	170 80	.027" .027"
8295922	SXP 35	3/8"	Vertical 90°	250 80	.060" .060"
8293957	SWXP 35	3/8"	Horizontal	80	.060"

Part Number	Model	Rod Size	Mount Direction	UL Load Rating (lbs)	UL Min. Steel Thickness	Listed Application
SAMMYS FOR STEEL - CONDUIT, TUBING, AND CABLE						
8150922	XP 20	3/8"	Vertical	283	.027"	Max 4 trade size EMT, RMC, and IMC & 5 trade size rigid PVC conduit
8153922	XP 35	3/8"	Vertical	500	.060"	Max 4 trade size EMT & 6 trade sze RMC, IMC, and rigid PVC conduit
8294922	SXP 20	3/8"	Vertical	283	.027"	Max 4 trade size EMT, RMC, and IMC & 5 trade size rigid PVC conduit
8295922	SXP 35	3/8"	Vertical	500	.060"	Max 4 trade size EMT & 6 trade sze RMC, IMC, and rigid PVC conduit
8293957	SWXP 35	3/8"	Horizontal	500	.060"	Max 4 trade size EMT & 6 trade sze RMC, IMC, and rigid PVC conduit
8149957	CZ2000	1/4" or 3/8"	Onto Vertical Rod			UL Listed 4S16 - Cable Hanger, Cat. No. C-Z2000 Plenum Rated, Complies w/ NEC Standards

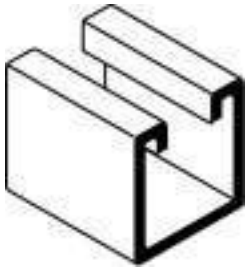
Sheet Steel Gauges

Gauge No.	22 ga.	20 ga.	18 ga.	16 ga.	14 ga.	12 ga.	1/8"	3/16"	1/4"
Nominal Decimal Equivalent	.030"	.036"	.048"	.060"	.075"	.105"	.125"	.188"	.250"

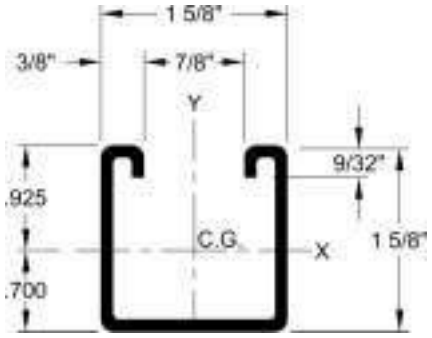
*SWG 25-380 Maximum pipe size in composite wood joist allowed by UL is 3-1/2"
*SWG 25-380 Maximum pipe size in wood timber or joist allowed by UL is 4"
**SWG 20 Maximum pipe size in composite wood joist allowed by UL is 2-1/2"
**SWG 20 Maximum pipe size in wood timber or joist allowed by UL is 3"

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.

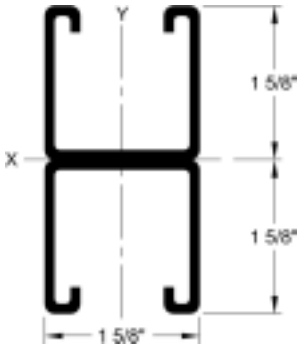
A-12 CHANNEL



Metal thickness is 12 Ga. (.105")



A-12



A-12A

Elements of Section

Channel Catalog Number	Weight lbs./ft.	Area of Section Sq. In.	AXIS X-X			AXIS Y-Y		
			I(in.^{4})	S(in.^{3})	R(in.)	I(in.^{4})	S(in.^{3})	R(in)
A-12	1.89	.583	.188	.203	.581	.257	.316	.680
A-12A	3.78	1.166	.920	.566	.910	.514	.632	.680

I = Moment of inertia S = Section modulus R = Radius of gyration

Beam and Column Loads Data

Channel Catalog Number	Beam Span or Unbraced Column Height	Uniform Load at Stress of 25,000 PSI (lbs.)	Deflection at Stress of 25,000 PSI (in.)	Uniform Load (lbs.) When Maximum Deflection = $\frac{SPAN}{240}$	Maximum Allowable Load of Column (lbs.)
A-12	18"	2213	.031	2213	11300
	24"	1680	.055	1680	9700
	30"	1340	.086	1340	8850
	36"	1125	.125	1125	8600
	42"	950	.168	950	7550
	48"	855	.225	757	6720
	60"	690	.356	484	5800
	72"	555	.594	336	4970
	84"	490	.693	247	4250
	96"	433	.915	189	3500
	120"	335	1.382	121	2100
A-12A	18"	6530	.018	6530	24340
	24"	4895	.033	4895	21800
	30"	3800	.050	3800	21500
	36"	3100	.070	3100	21000
	42"	2700	.097	2700	20600
	48"	2300	.124	2300	19900
	60"	1930	.203	1930	17950
	72"	1560	.284	1560	15940
	84"	1360	.393	1210	14750
	96"	1200	.438	926	12650
	120"	953	.680	593	8000

Beam loads: Loads listed are uniformly distributed, for loads concentrated at center of span multiply uniform load at table by .5 and multiply the deflection by .8. When deflection is not a factor use stress of 25,000 PSI. When deflection is a factor use deflection of $\frac{SPAN}{240}$.

Column loads: Loads listed are for unbraced heights as listed. Modulus of elasticity = 29,000,000 PSI. Slotted or punched channel reduce load rating 10%.

Fig. 22 - Hanger for CPVC Plastic Pipe & IPS Steel Pipe** Single Fastener Strap (B-Line B3181)

Size Range: 3/4" (20mm) thru 2" (50mm) CPVC pipe

Material: Pre-Galvanized Steel

Function: Intended to perform as a hanger to support CPVC piping used in automatic fire sprinkler systems. The product acts as a hanger when tab is upward and the fastener screw is in the horizontal position. Fig. 22 can be installed on the top of a beam, but in this situation acts as a guide to the piping which is supported by the beam itself. It is not intended to support CPVC pipe from under a flat horizontal surface, such as a ceiling.

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.9mm) steel using (1) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

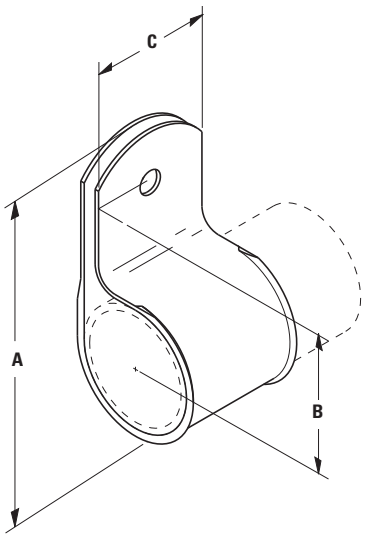
Features: Fig. 22 incorporates features which protect the pipe and ease installation. The flared edge design protects CPVC pipe from any rough surface. It is easily attached to the building structure using the special UL Listed hex head self threading screw* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment to be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

Finish: Pre-Galvanized

Order By: Figure number and pipe size.

* Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.

** With reduced spacing, consult factory.



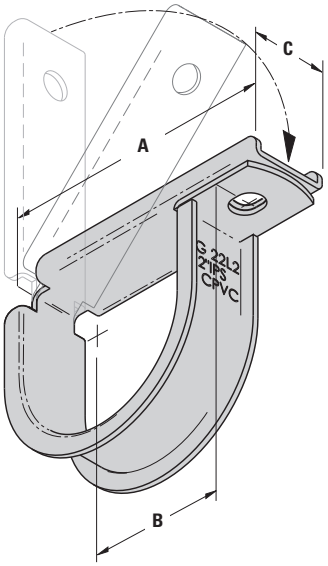
Part No.	CPVC Pipe Size in. (mm)	A in. (mm)	B in. (mm)	C in. (mm)	Max. Hanger Spacing Ft. (m)	Fastener Hex Head Size in. (mm)	Approx. Wt./100 Lbs. (kg)
22-3/4	3/4" (20)	2 7/16" (61.9)	1 5/16" (33.3)	1 3/16" (30.2)	5 1/2 (1.67)	5/16" (7.9)	9 (4.1)
22-1	1" (25)	2 11/16" (68.3)	1 7/16" (36.5)	1 3/16" (30.2)	6 (1,83)	5/16" (7.9)	9 (4.1)
22-1 1/4	1 1/4" (32)	3 1/16" (77.8)	1 5/8" (42.3)	1 3/16" (30.2)	6 1/2 (1.98)	5/16" (7.9)	11 (5.0)
22-1 1/2	1 1/2" (40)	3 5/16" (84.1)	1 3/4" (44.4)	1 3/16" (30.2)	7 (2.13)	5/16" (7.9)	12 (5.4)
22-2	2" (50)	3 3/4" (95.2)	2 1/8" (54.6)	1 3/16" (30.2)	8 (2.44)	5/16" (7.9)	15 (6.8)

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

Fig. 22L2 - One Hole Hanger/Restrainer for CPVC & Steel Pipe

TOLCO

c UL us LISTED



Size Range: 3/4" (20mm) thru 2" (50mm) CPVC & steel pipe

Material: Pre-Galvanized Steel

Function: cULus Listed to perform as a hanger and restrainer for CPVC or IPS piping systems. The innovative design also allows for a preferred installation location close to a CPVC fitting without applying damaging compression forces on the pipe which could result in serious Mechanical ESC (Environmental Stress Cracking).

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.9mm) steel using (1) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

Installation Note: Comes in open position for easier installation. Because of multi – structural installation possibilities, specific fastener not included; see notes below for various applications.

For Concrete Installation — UL requires a minimum test load of 340 lbs for CPVC hangers and 750 lbs for steel pipe hangers; verify anchors meet or exceed these requirements.

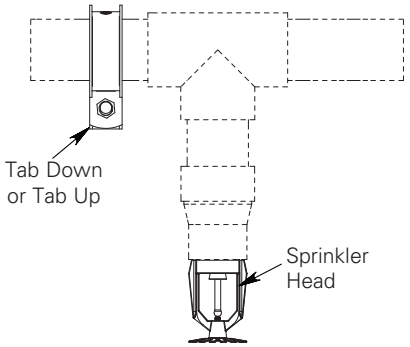
For Wood Installation — Test results have shown that #14 x 1½" wood screws will support the required load for c UL us.

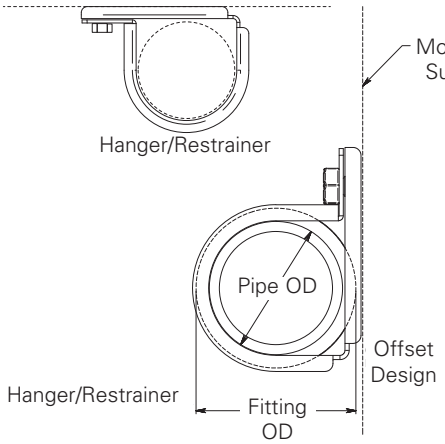
For Steel Installation — Test results have shown that 1/4" x 1" (min. 20ga steel) Tek type screw will support required UL load.

Finish: Pre-Galvanized

Order By: Part number

Patent Pending





Part No.	CPVC or Steel Pipe Size in.	(mm)	A in.	(mm)	B in.	(mm)	C in.	(mm)	Max. Hanger Spacing - CPVC Ft.	(m)	Max. Hanger Spacing - Steel Ft.	(m)	Approx. Wt./100 Lbs.	(kg)
22L2-3/4	3/4"	(20)	2 3/16"	(55.6)	15/16"	(23.8)	3/4"	(19.0)	5 1/2	(1.67)	NA	(NA)	9	(4.1)
22L2-1	1"	(25)	2 1/2"	(63.5)	1 1/8"	(28.6)	3/4"	(19.0)	6	(1,83)	12	(3.66)	9	(4.1)
22L2-1 1/4	1 1/4"	(32)	2 13/16"	(71.4)	1 1/4"	(31.7)	3/4"	(19.0)	6 1/2	(1.98)	12	(3.66)	11	(5.0)
22L2-1 1/2	1 1/2"	(40)	3 1/8"	(79.4)	1 7/16"	(36.5)	3/4"	(19.0)	7	(2.13)	15	(4.57)	12	(5.4)
22L2-2	2"	(50)	3 9/16"	(90.5)	1 5/8"	(41.3)	3/4"	(19.0)	8	(2.44)	15	(4.57)	15	(6.8)

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

Fig. 23 - Hanger for CPVC Plastic Pipe & IPS Steel Pipe** Double Fastener Strap (B-Line B3182)

Size Range: 3/4" (20mm) thru 3" (80mm) CPVC pipe

Material: Pre-Galvanized Steel

Function: Intended to perform as a hanger to support CPVC piping used in automatic fire sprinkler systems. Fig. 23 can be installed on the top, bottom or side of a beam.

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** sizes 3/4" (20mm) thru 2" (50mm) to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.9mm) steel using (2) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

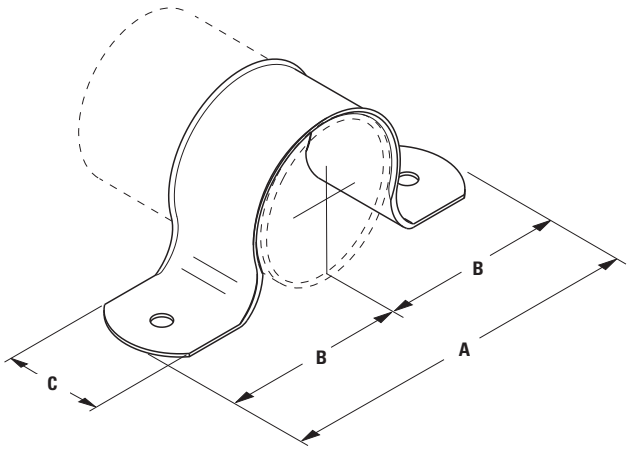
Features: Fig. 23 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. It also incorporates snap restrainers allowing easier and faster installation. Easily attaches to the building structure using the two UL Listed hex head self threading screws* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

Finish: Pre-Galvanized

Order By: Figure number and pipe size

* Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.

** With reduced spacing, consult factory.



Part No.	CPVC Pipe Size in.	(mm)	A in.	(mm)	B in.	(mm)	C in.	(mm)	Max. Hanger Spacing Ft.	(m)	Fastener Hex Head Size in.	(mm)	Approx. Wt./100 Lbs.	(kg)
23-3/4	3/4"	(20)	3 1/8"	(79.4)	1 9/16"	(39.7)	1 3/16"	(30.2)	5 1/2	(1.67)	5/16"	(7.9)	9	(4.1)
23-1	1"	(25)	3 3/8"	(85.7)	1 11/16"	(42.9)	1 3/16"	(30.2)	6	(1,83)	5/16"	(7.9)	9	(4.1)
23-1 1/4	1 1/4"	(32)	4 3/16"	(106.4)	2 3/32"	(53.1)	1 3/16"	(30.2)	6 1/2	(1.98)	5/16"	(7.9)	11	(5.0)
23-1 1/2	1 1/2"	(40)	4 7/16"	(112.7)	2 7/32"	(56.3)	1 3/16"	(30.2)	7	(2.13)	5/16"	(7.9)	12	(5.4)
23-2	2"	(50)	4 7/8"	(123.8)	2 7/16"	(61.9)	1 3/16"	(30.2)	8	(2.44)	5/16"	(7.9)	15	(6.8)
23-2 1/2	2 1/2"	(65)	5 3/8"	(136.5)	2 11/16"	(68.3)	1 3/16"	(30.2)	Consult Factory		5/16"	(7.9)	22	(10.0)
23-3	3"	(80)	6"	(152.4)	3"	(76.2)	1 3/16"	(30.2)	Consult Factory		5/16"	(7.9)	25	(11.3)

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

Fig. 24 - Hanger for CPVC Plastic Pipe & IPS Steel Pipe** Double Fastener Strap Side Mounted (B-Line B3183)

TOLCO

c UL us LISTED

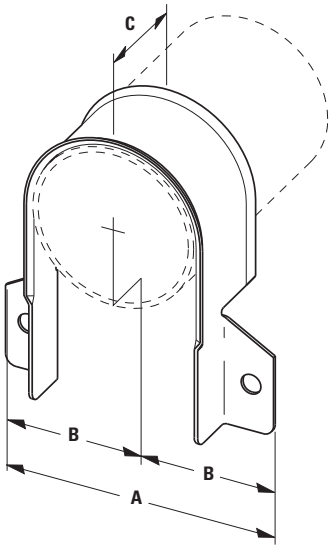
Size Range: 3/4" (20mm) thru 2" (50mm) CPVC pipe

Material: Pre-Galvanized Steel

Function: Intended to perform as a hanger to support CPVC piping used in automatic fire sprinkler systems. Can be installed on the top or on the bottom of a beam.

Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge (0.912mm) steel using (2) 1/4" x 1" tek type screws. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

Features: Fig. 24 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. Easily attaches to the building structure using the two UL Listed hex head self threading screws* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.



Finish: Pre-Galvanized

Order By: Figure number and pipe size

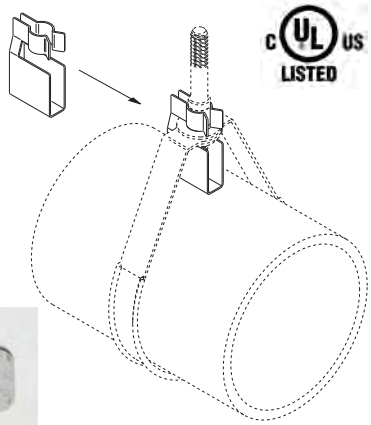
* Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.

** With reduced spacing, consult factory.

Part No.	CPVC Pipe Size in.	(mm)	A in.	(mm)	B in.	(mm)	C in.	(mm)	Max. Hanger Spacing Ft.	(m)	Fastener Hex Head Size in.	(mm)	Approx. Wt./100 Lbs.	(kg)
24-3/4	3/4"	(20)	2 5/16"	(58.7)	1 5/32"	(27.8)	1 3/16"	(30.2)	5 1/2	(1.67)	5/16"	(7.9)	9	(4.1)
24-1	1"	(25)	2 5/8"	(66.7)	1 5/16"	(33.3)	1 3/16"	(30.2)	6	(1.83)	5/16"	(7.9)	9	(4.1)
24-1 1/4	1 1/4"	(32)	3"	(76.2)	1 1/2"	(38.1)	1 3/16"	(30.2)	6 1/2	(1.98)	5/16"	(7.9)	11	(5.0)
24-1 1/2	1 1/2"	(40)	3 1/4"	(82.5)	1 5/8"	(42.3)	1 3/16"	(30.2)	7	(2.13)	5/16"	(7.9)	12	(5.4)
24-2	2"	(50)	3 11/16"	(93.7)	1 27/32"	(43.6)	1 3/16"	(30.2)	8	(2.44)	5/16"	(7.9)	15	(6.8)

Fig. 25 - Surge Restrainer

c UL us LISTED



Size Range: — One size fits 3/4" (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, 2010 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 3/4" (20mm) thru 2" (40mm).

Patent #5,344,108

TOLCO

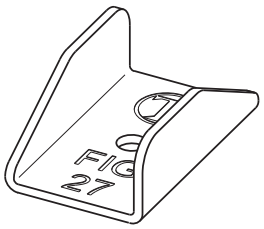
Fig. 27B - Speed Nut

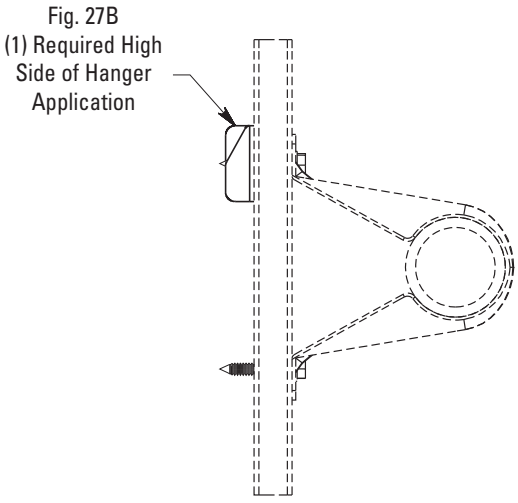
Size Range: — Fits screws supplied with all CPVC hangers.

Material: — Steel

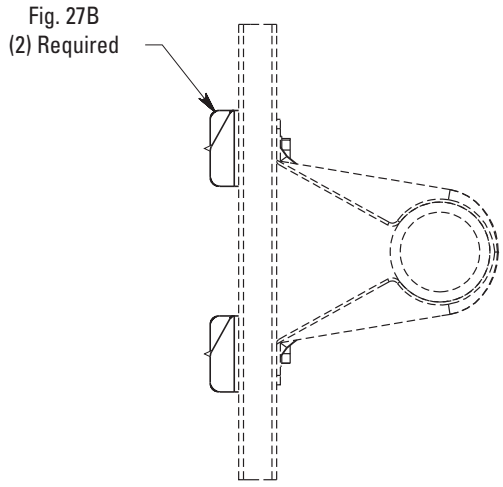
Finish: — Pre-Galvanized (Zinc)

Function: — To be used anywhere a screw cannot achieve full embedment due to thickness of wood structural material when installed. Fig. 27B allows full pull out load capacity of screws when installed to the standard screws supplied with all CPVC hangers (Fig. 22, 23, 24, 28, 28M, 29, and B3184).

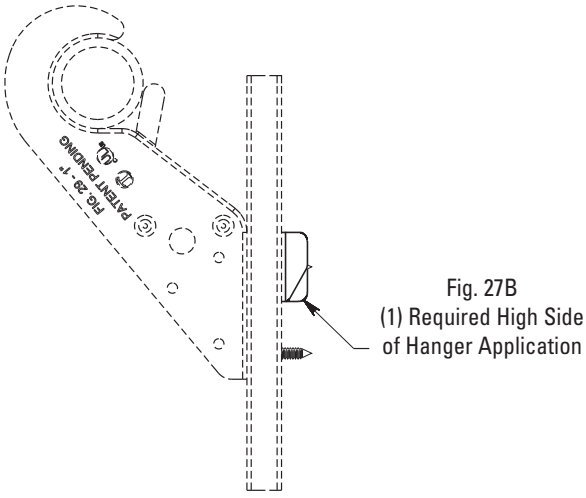




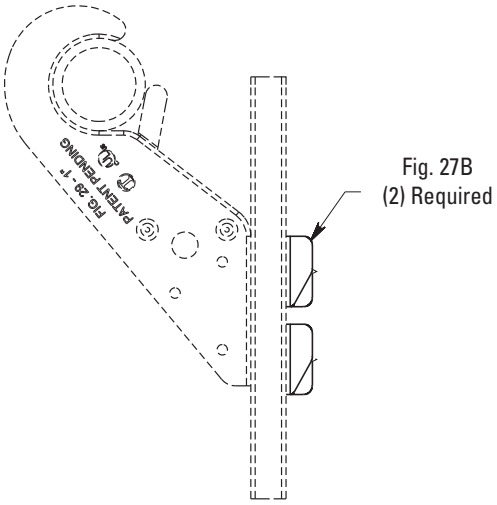
Hanger Application



Hanger and Restraint Application



Hanger Application



Hanger and Restraint Application

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

Fig. 28 - "Stand-Off" Hanger & Restrainer for CPVC Plastic Pipe & IPS Steel Pipe **

TOLCO

c UL us LISTED

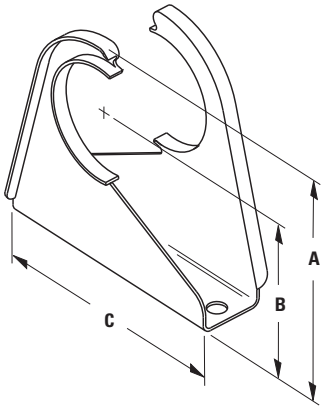
Size Range: — 3/4" (20mm) through 2" (50mm)

Material: — Steel, Pre-Galvanized

Function: — Designed to be used as a hanger and restrainer for CPVC piping where the "stand-off" design will ease installation by eliminating the need for wood blocking.

Features:

- Flared edge design protects CPVC pipe from any rough or abrasive surfaces.
- Unique twist and lock design holds pipe firmly in place and allows retrofit type of installation.
- The "Stand-Off" design eliminates the need for wood block extension.
- Can be installed on horizontal or vertical piping regardless of mounting surface orientation.
- Attaches easily to wood structure with two hex head self-threading screws furnished with product.
- Installs easily using rechargeable electrical driver with 5/16" (7.9mm) extension socket eliminating impact tool damage to pipe.
- Attaches easily to steel, minimum 18 gauge (1.024mm) with (2) 1/4" x 1" tek type self drilling tapping screws.
- UL Listed as a hanger and a restrainer for fire sprinkler piping.

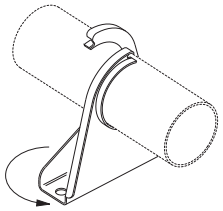


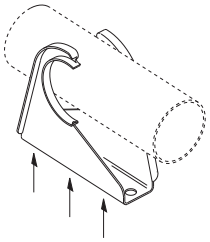
Approvals: — Underwriters Laboratory Listed in the USA **(UL)** and Canada **(cUL)** to support automatic fire sprinkler systems. May be installed into wood using fasteners supplied with product, or into minimum 18 gauge steel using (2) 1/4" x 1" tek type screws. Meets and exceeds the requirements of NFPA 13, 13R and 13D. Fig. 28 satisfies the UL vertical restraint requirement where needed. UL Listed as a hanger and vertical restraint when installed on 3/8" (9.5mm) composite wood material. Use two Fig. 27B Speed Nuts when used as a hanger and restraint. Use one Fig. 27B Speed Nut on the upper installed screw when used as a hanger only.

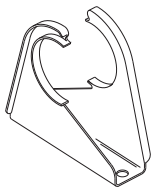
Order by: — Figure number and pipe size.

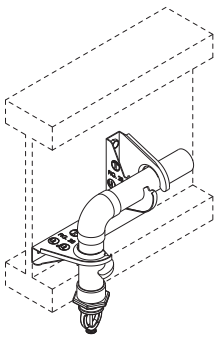
Pat. # 7,455,268, Pat. # 7,832,248

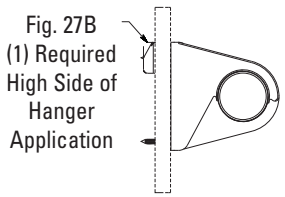
** With reduced spacing, consult factory.



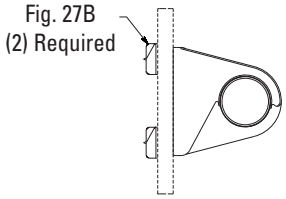




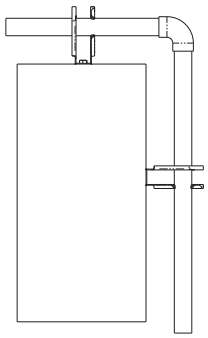




Hanger Application



Hanger and Restraint Application



Part No.	Pipe Size in.	Pipe Size (mm)	A in.	A (mm)	B in.	B (mm)	C in.	C (mm)	Max Hanger Spacing Ft.	Max Hanger Spacing (m)	Approx. Wt./100 lbs.	Approx. Wt./100 (kg)
28-3/4	3/4"	(20)	3 1/32"	(77.0)	2"	(50.8)	3 1/2"	(88.9)	5 1/2	(1.67)	18	(8.1)
28-1	1"	(25)	3 5/16"	(84.1)	2 3/16"	(55.6)	3 1/2"	(88.9)	6	(1.83)	21	(9.5)
28-1 1/4	1 1/4"	(32)	3 5/8"	(92.1)	2 3/8"	(60.3)	3 1/2"	(88.9)	6 1/2	(1.98)	23	(10.4)
28-1 1/2	1 1/2"	(40)	4"	(101.6)	2 1/2"	(63.5)	3 1/2"	(88.9)	7	(2.13)	31	(14.0)
28-2	2"	(50)	4 1/2"	(114.3)	2 11/16"	(68.3)	3 5/8"	(92.1)	8	(2.44)	34	(15.4)

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

Fig. 28M - Offset Hanger & Restrainer for CPVC Plastic Pipe and IPS Steel Pipe **

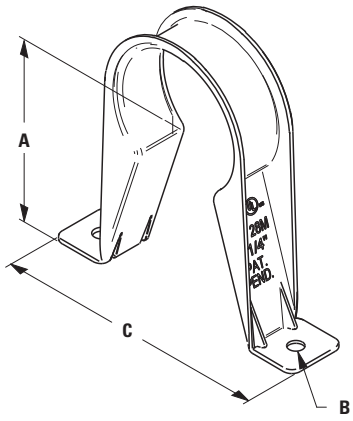
Size Range: 3/4" (20mm) thru 2" (32mm)

Material: Steel, Pre-Galvanized

Function: Designed to be used as a hanger and restrainer for CPVC piping or steel piping where the "stand-off" design will ease installation by eliminating the need for wood blocking.

Features:

- Flared edge design protects CPVC pipe from any rough or abrasive surfaces
- Unique snap-on design holds pipe firmly in place and allows retrofit type of installation
- The "Stand-Off" design eliminates the need for wood block extension
- Can be installed on horizontal or vertical piping regardless of mounting surface orientation
- Attaches easily to wood structure with two hex head self-threading screws furnished with product
- Installs easily using rechargeable electrical driver with 5/16" (7.9mm) extension socket eliminating impact tool damage to pipe
- Attaches easily to steel, minimum 18 gauge (1.024mm) with (2) 1/4" x 1" tek type self drilling tapping screws
- **cULus** Listed as a hanger and a restrainer for fire sprinkler piping



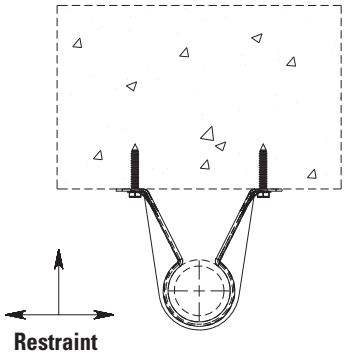
Installation Note: When installed in wood structural members and threads from the #10 x 1" screws are exposed, use Fig. 27B speed nut to secure

Approvals: Underwriters Laboratory Listed in the USA **(UL)** and Canada **(cUL)** to support automatic fire sprinkler systems.
May be installed into wood using fasteners screws.
Meets and exceeds the requirements of NFPA 13, 13R and 13D. Fig. 28M satisfies the UL vertical restraint requirements where needed.

Order By: Figure number and pipe size

Patent #7,744,042

** With reduced spacing, consult factory.



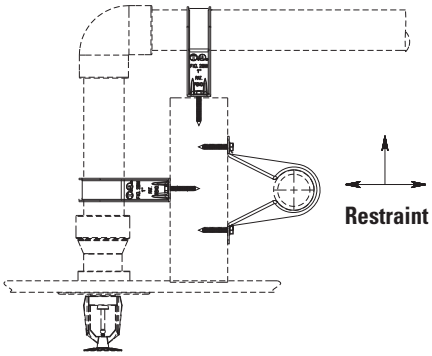
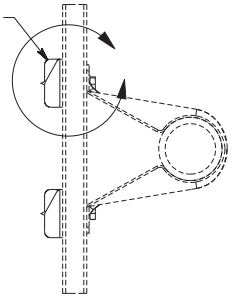
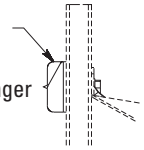


Fig. 27B
(2) Required



Hanger and Restraint Application

Fig. 27B
(1) Required
High Side of Hanger



Detail A Hanger Application

Part No.	Pipe Size in.	(mm)	A in.	(mm)	Hole Dia. B in.	(mm)	C in.	(mm)	Max Spacing* in.	(mm)	Approx. Wt./100 lbs.	(kg)
28M-3/4	3/4"	(20)	2"	(50.8)	3/16"	(4.8)	3 5/16"	(84.1)	5'-6"	(1676)	9	(4.1)
28M-1	1"	(25)	2 1/8"	(54.0)	3/16"	(4.8)	3 1/2"	(88.9)	6'-0"	(1829)	12	(5.4)
28M-1 1/4	1 1/4"	(32)	2 5/16"	(58.7)	3/16"	(4.8)	3 1/2"	(88.9)	6'-6"	(1981)	13	(5.9)
28M-1 1/2	1 1/2"	(49)	2 7/16"	(61.9)	3/16"	(4.8)	3 7/8"	(98.4)	7'-0"	(2133)	14	(6.3)
28M-2	2"	(50)	2 5/8"	(66.7)	3/16"	(4.8)	4 7/16"	(112.7)	8'-0"	(2438)	15	(6.8)

* Required per NFPA 13 for CPVC plastic pipe

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

Fig. 29 - Double Offset Hanger & Restrainer for CPVC Plastic Pipe & IPS Steel Pipe**

TOLCO

c UL us LISTED

Size Range: Available in 3/4" (20mm) and 1" (25mm) pipe sizes

Material: Pre-Galvanized Steel

Function: Intended to perform as a hanger and restrainer for CPVC, plastic fire sprinkler pipe. Provides double offset 1 1/2" (20mm) x 1 1/2" (20mm) from mounting surface. This design will ease installation by eliminating the need for wood block extension and allow retro-fit attachment of hanger to sprinkler pipe.

Features:

- Thumb tab provides protection to restrain pipe in rough job site conditions. Tab is not required to be bent for listed installation.
- Offset edge eliminates abrasion.
- Attaches easily to wood structure with two special #10 x 1" hex head self-threading screws furnished with product.
- Can be used as a single offset hanger by aligning "dimples" with top of mounting surface and utilizing two fasteners in two of the three holes provided.

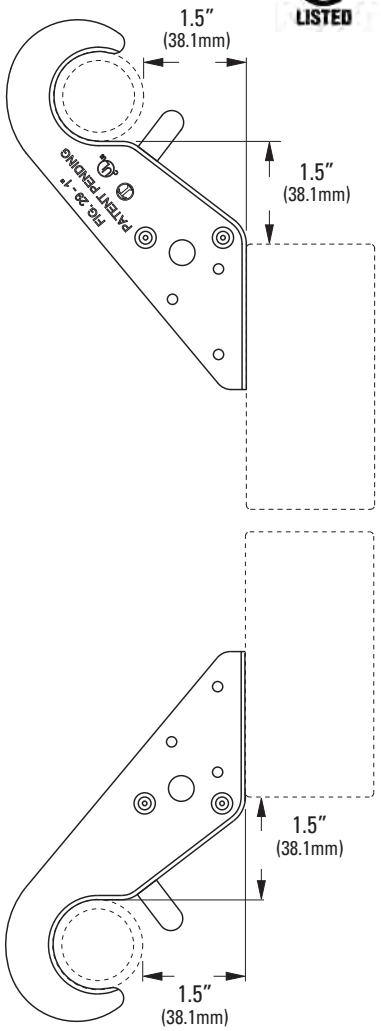
Approvals: Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** as a hanger and restrainer to support fire sprinkler systems. Meets and exceeds requirements of NFPA 13, 13R and 13D.

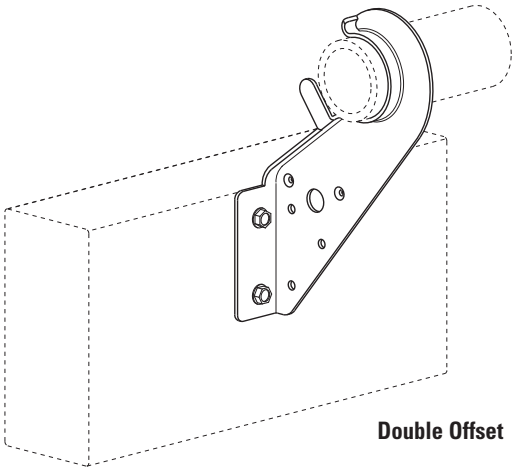
Finish: Pre-Galvanized

Order By: Figure number and pipe size.

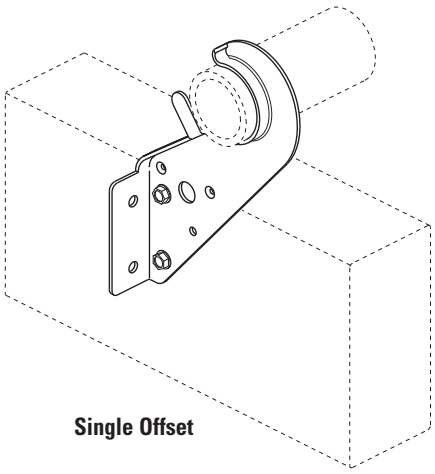
Patent Pending

** With reduced spacing, consult factory.





Double Offset



Single Offset

Install using a rechargeable electric drill fitted with a 5/16" (7.9mm) socket attachment with the special hex head self-tapping screws provided. Install screws until they bottom out. Pipe can be "snapped" into hanger before or after installation of the screws to the mounting surface. "Thumb tab" may be bent up to provide additional protection to the pipe, but is not required for performance of the hanger / restrainer function.

B3184 - Offset Hanger for CPVC Plastic Pipe and IPS Steel Pipe

Size Range: 3/4" (20mm) thru 2" (32mm)

Material: Pre-Galvanized Steel

Function: Designed to be used as a hanger for CPVC piping or steel piping where the stand-off design will ease installation by eliminating the need for wood blocking.

Features:

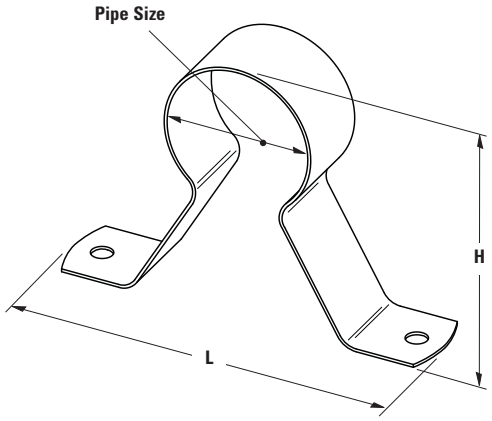
- Flared edge design protects CPVC pipe from any rough or abrasive surfaces
- The stand-off design eliminates the need for wood block extension
- Can be installed on horizontal or vertical piping regardless of mounting surface orientation
- Attaches easily to wood structure with two hex head self-threading screws furnished with product
- **cULus** Listed as a hanger for fire sprinkler piping

Installation Note: When installed in wood structural members and threads from the #10 x 1" screws are exposed, use Fig. 27B speed nut to secure

Approvals: Underwriters Laboratory Listed in the USA **(UL)** and Canada **(cUL)** 3/4" (20mm) thru 2" (50mm) to support automatic fire sprinkler systems. May be installed into wood using fasteners screws. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

Order By: Figure number and pipe size

Patent # 7,744,042



Part No.	CPVC Pipe Size in.	(mm)	L Overall in.	(mm)	H Overall in.	(mm)	Max. Hanger Spacing ft.	(m)	Fastener Hex Head Size in.	(mm)	Approx. Wt./100 Lbs.	(kg)
B3184-3/4	3/4"	(20)	2 9/16"	(65.1)	4 1/4"	(107.9)	5 1/2	(1.67)	5/16"	(7.9)	9.0	(4.1)
B3184-1	1"	(25)	2 13/16"	(71.4)	4 1/2"	(114.3)	6	(1,83)	5/16"	(7.9)	10.0	(4.5)
B3184-1 1/4	1 1/4"	(32)	3 3/16"	(81.0)	4 5/8"	(117.5)	6 1/2	(1.98)	5/16"	(7.9)	12.0	(5.4)
B3184-1 1/2	1 1/2"	(40)	3 7/16"	(87.3)	5"	(127.0)	7	(2.13)	5/16"	(7.9)	12.0	(5.4)
B3184-2	2"	(50)	3 7/8"	(98.4)	5"	(127.0)	8	(2.44)	5/16"	(7.9)	15.0	(6.8)

This product is cULus Listed as a hanger ONLY.
For hanger and restraint applications, please refer to B-Line Fig. 28 (page 39) or Fig. 28M (page 40).

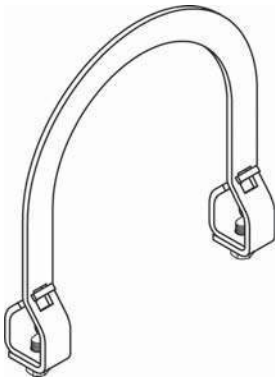
All dimensions in charts and on drawings are in inches. Dimensions shown in parentheses are in millimeters unless otherwise specified.

Fig. 1001 - Sway Brace Attachment

Component of State of California OSHPD Approved Seismic Restraints System

c UL US LISTED

FM APPROVED



Size Range — Pipe size to be braced: 2½" thru 8" IPS.* Pipe size used for bracing: 1" and 1¼" Schedule 40 IPS.

Material — Carbon Steel

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

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

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

Approvals — Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Restraints Catalog 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 the TOLCO Seismic Restraint Systems Guidelines.

Maximum Design Load
Sch. 7 - 1600 lbs.
Sch. 10 & 40 w/1" Brace Pipe - 2015 lbs.
Sch. 10 & 40 w/1¼" Brace Pipe - 2765 lbs.

FM Approved Design Loads*
2½" - 2400 lbs.
3" - 4" - 2500 lbs.
5" - 8" - 1500 lbs.

Finish — Plain

Note — Available in Electro-Galvanized and HDG finish.

Order By — Indicate pipe size to be braced followed by pipe size used for bracing, figure number and finish.

Important Note — The Fig. 1001 is precision manufactured to perform its function as a critical component of a complete bracing assembly. **To ensure performance, the UL Listing requires that the Fig. 1001 must be used only with other TOLCO bracing products. The Fig 1001 is not intended for use with the Fig. 907 4-Way Longitudinal Brace Attachment.**

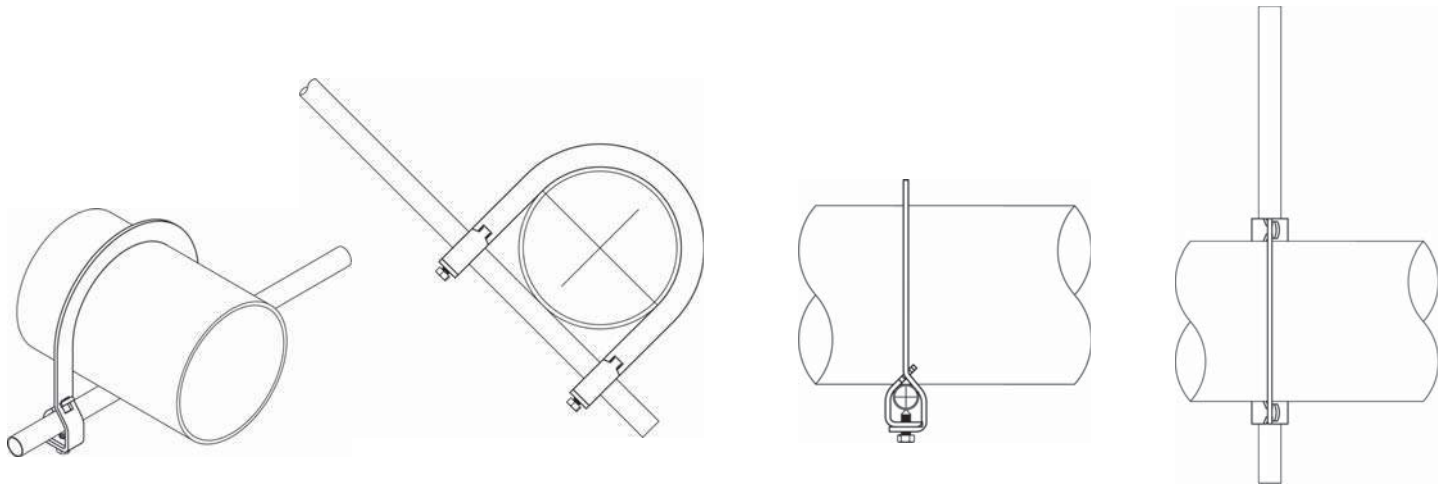


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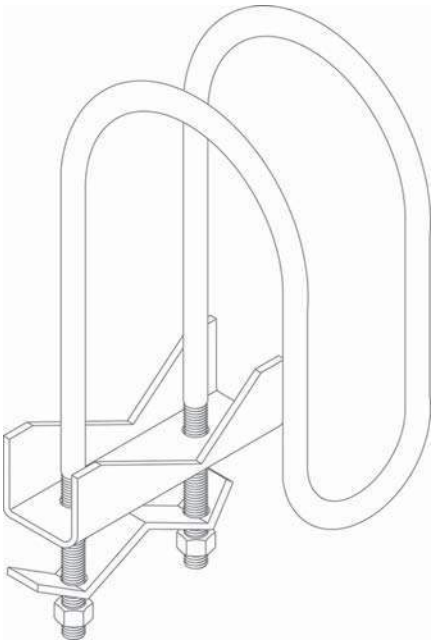
Fig. 1000 - "Fast Clamp" Sway Brace Attachment

Component of State of California OSHPD Approved Seismic Restraints System



Size Range — Pipe size to be braced: 1" thru 6" Schedule 10 thru 40 IPS.* Pipe size used for bracing: 1" and 1¼" Schedule 40 IPS.

* Additionally **(UL)** approved for use to brace Schedule 7 sprinkler pipe up to 4" (maximum horizontal design load 655 lbs.) Torque requirement 6 — 8 ft. lbs.

Material — Carbon Steel

Function — For bracing pipe against sway and seismic disturbance. The pipe attachment component of a sway brace system: Fig. 1000 is used in conjunction with a TOLCO Fig. 900 Series Fitting and joined together with bracing pipe per NFPA 13* or TOLCO OSHPD Approved Seismic Manual, forming a complete sway brace assembly.

Features — Field adjustable, making critical pre-engineering of bracing pipe unnecessary. Unique design requires no threading of bracing pipe. Can be used as a component of a 4-way riser brace. Can be used as longitudinal brace with Fig. 907. Comes assembled and individually packaged with illustrated installation instructions — sizes are clearly marked. Steel leaf spring insert provided to assure installer and inspector necessary minimum torque has been achieved.

Installation — The Fig. 1000 is the "braced pipe" attachment component of a lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component, Fig. 980, 910 or 909 to form a complete bracing assembly. Follow NFPA 13 and/or OSHPD guidelines.

To Install — Place the Fig. 1000 over the pipe to be braced, insert bracing pipe through opening leaving a minimum of 1" extension. Brace pipe can be installed on top or bottom of pipe to be braced. Tighten hex nuts until leaf spring is flat. It is recommended that the brace angle be adjusted before hex nuts are fully tightened.

Approvals — Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Restraints Catalog 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 the TOLCO Seismic Restraint Systems Guidelines.

Application Note — Position Fast Clamp and tighten two hex nuts until leaf spring flattens. A minimum of 1" pipe extension beyond the Fig. 1000 is recommended.

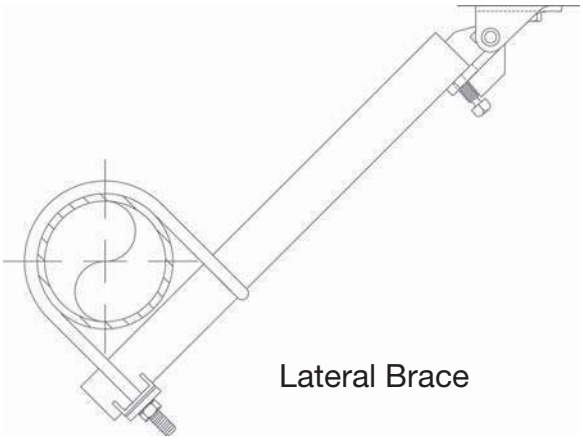
Finish — Plain

Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.

Order By — Order first by pipe size to be braced, followed by pipe size used for bracing, figure number and finish.

Maximum Design Load
1" thru 4" pipe size — 2015 lbs.
6" size — 1265 lbs.

FM Approved Design Loads*
1" - 2½" - 600 lbs.
3" - 4" - 700 lbs.



Lateral Brace

TOLCO® brand bracing components are desgined to be compatible **ONLY** with other TOLCO® brand bracing components, resulting in a Listed seismic bracing assembly. **DISCLAIMER** — NIBCO does **NOT** warrant against the failure of TOLCO® brand bracing components, in the instance that such TOLCO® brand bracing components are used in combination with products, parts or systems which are not manufactured or sold under the TOLCO® brand. NIBCO shall **NOT** be liable under any circumstance for any direct or indirect, incidental or consequential damages of any kind, including but not limited to loss of business or profit, where non-TOLCO brand bracing components have been, or are used.

Fig. 980 - Universal Swivel Sway Brace Attachment

c UL US LISTED
FM APPROVED

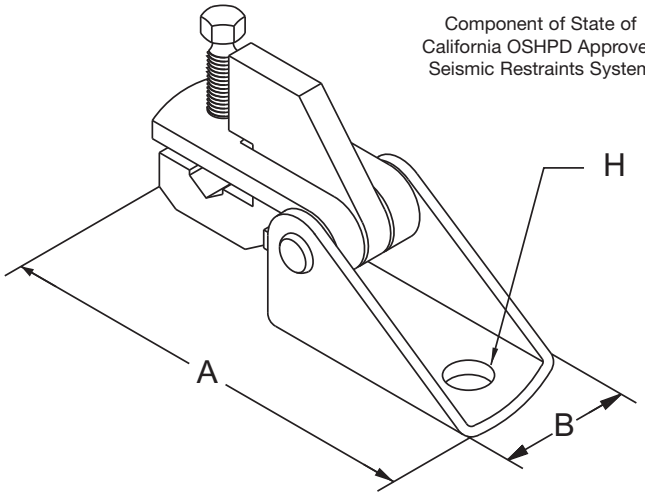
Component of State of California OSHPD Approved Seismic Restraints System

Size Range — One size fits bracing pipe 1" thru 2", TOLCO 12 gauge channel, and all structural steel up to 1/4" thick.

Material — Carbon Steel

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

Features — This product's design incorporates a **concentric** attachment opening which is critical to the performance of structural seismic connections. NFPA 13 (2010) 9.3.5.8.4 indicates clearly that fastener table load values are based only on concentric loading. Mounts to any surface angle. Break off bolt head assures verification of proper installation.



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

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

Approvals — Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Approved by Factory Mutual Engineering **(FM)**. Included in our Seismic Restraints Catalog 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 the TOLCO Seismic Restraint Systems Guidelines.

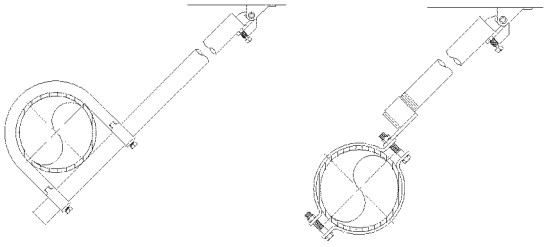
Note — The Fig. 980 Swivel Attachment and the Fig. 1001, Fig. 1000 , Fig. 2001 or Fig. 4A Pipe Clamp make up a sway brace system of **UL** Listed attachments and bracing materials which satisfies the requirements of Underwriters' Laboratories and the National Fire Protection Association **(NFPA)**

Finish — Plain

Note — Available in Electro-Galvanized finish.

Order By — Figure number and finish.

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



Lateral Brace

Dimensions • Weights

A	B	H*	Max. Design Load Lbs. (cULus)	**Max. Design Load Lbs. (FM)	Approx. Wt./100
5¼	1⅞	17/32	2765	2800	132

* Available with hole sizes to accommodate up to 3/4" fastener. Consult factory.

** Load shown is allowable with brace installed, between 30° - 90°. No reduction of load based on brace angle is required.

TOLCO® brand bracing components are desgined to be compatible **ONLY** with other TOLCO® brand bracing components, resulting in a Listed seismic bracing assembly. **DISCLAIMER** — NIBCO does **NOT** warrant against the failure of TOLCO® brand bracing components, in the instance that such TOLCO® brand bracing components are used in combination with products, parts or systems which are not manufactured or sold under the TOLCO® brand. NIBCO shall **NOT** be liable under any circumstance for any direct or indirect, incidental or consequential damages of any kind, including but not limited to loss of business or profit, where non-TOLCO brand bracing components have been, or are used.

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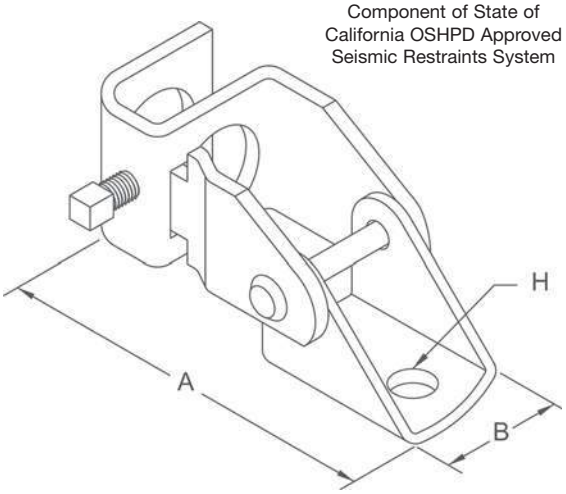
Fig. 909 - No-Thread Swivel Sway Brace Attachment

c UL US LISTED

Component of State of California OSHPD Approved Seismic Restraints System



Size Range — 1" bracing pipe. For brace pipe sizes larger than 1", use TOLCO Fig. 980.

Material — Carbon Steel, hardened cone point engaging screw

Function — The structural component of a sway and seismic bracing system.

Features — This product's design incorporates a **concentric** attachment opening which is critical to the performance of structural seismic connections. NFPA 13 (2010) 9.3.5.8.4 indicates clearly that fastener table load values are based only on concentric loading. No threading of the bracing pipe is required. Open design allows for easy inspection of pipe engagement.

Application Note — The Fig. 909 is used in conjunction with the TOLCO Fig. 1000, Fig. 1001, Fig. 4 (A) or Fig. 4L pipe clamp, and joined together with bracing pipe. Sway brace assemblies are intended to be installed in accordance with NFPA 13 (or TOLCO State of California OSHPD Approved Seismic Restraint Manual) and the manufacturer's installation instructions. The required type, number and size of fasteners used for the structure attachment fitting shall be in accordance with NFPA 13 and/or OSHPD.

Approvals — Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)**. Included in our Seismic Restraints Catalog 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 the TOLCO Seismic Restraint Systems Guidelines.

Installation Instructions — The Fig. 909 is the structural or transitional attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO "braced pipe" attachment, Fig. 1000, 1001, 4A, 4B or 4L to form a complete bracing assembly. NFPA 13 and/or OSHPD guidelines should be followed.

To Install — Place the Fig. 909 onto the bracing pipe. Tighten the set bolt until head bottoms out on surface. Attachment can pivot for adjustment to proper brace angle.

Finish — Plain

Note — Available in Electro-Galvanized and HDG finish.

Order By — Figure number, pipe size and finish.

Dimensions • Weights

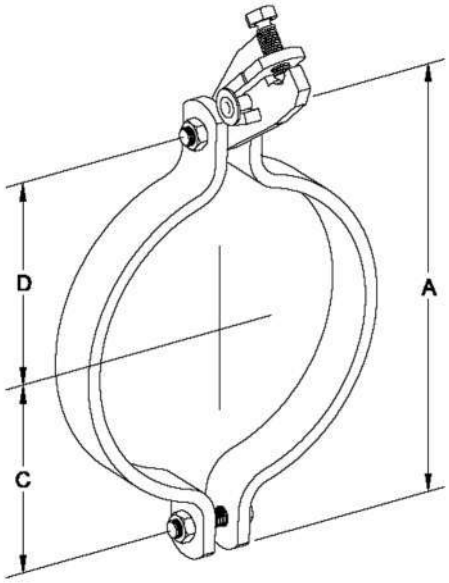
Pipe Size	A	B	Hole Size H*	Max. Design. Load Lbs.	Max. Design Load Lbs. w/Washer	Approx. Wt./100
1	6	1⅝	17/32	2015	2765	91

* Available with hole sizes to accommodate up to 3/4" fastener. Consult Factory.

TOLCO® brand bracing components are desgined to be compatible **ONLY** with other TOLCO® brand bracing components, resulting in a Listed seismic bracing assembly. **DISCLAIMER** — NIBCO does **NOT** warrant against the failure of TOLCO® brand bracing components, in the instance that such TOLCO® brand bracing components are used in combination with products, parts or systems which are not manufactured or sold under the TOLCO® brand. NIBCO shall **NOT** be liable under any circumstance for any direct or indirect, incidental or consequential damages of any kind, including but not limited to loss of business or profit, where non-TOLCO brand bracing components have been, or are used.

Fig. 4L
Longitudinal "In-Line" Sway Brace Attachment

c UL US LISTED
FM APPROVED



Size Range — 2½" through 8" IPS.

Material — Carbon Steel

Function — For bracing pipe against sway and seismic disturbance.

Approvals — Underwriter's Laboratories Listed in the USA **(UL)** and Canada **(cUL)** 2½" - 8". Approved by Factory Mutual Engineering **(FM)**, 2½" - 8" pipe.

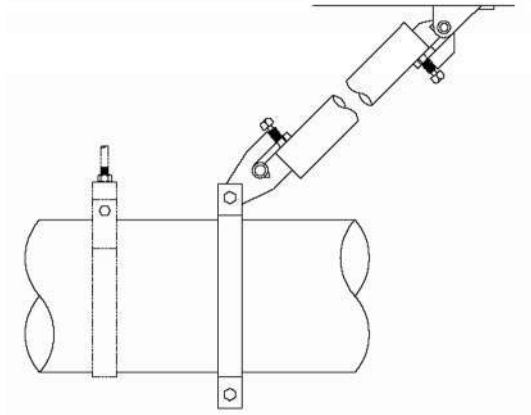
Installation Instructions — The Fig. 4L is the "braced pipe" attachment component of a longitudinal sway brace assembly. It is intended to be combined with the "bracing pipe" and TOLCO structural attachment component to form a complete bracing assembly. NFPA 13 and/or OSHPD guidelines should be followed.

To Install — Place the Fig. 4L over the pipe to be braced and tighten bolts. Then engage "bracing pipe" into jaw opening and tighten set bolt until hex head snaps off. Jaw attachment can pivot for adjustment to proper brace angle.

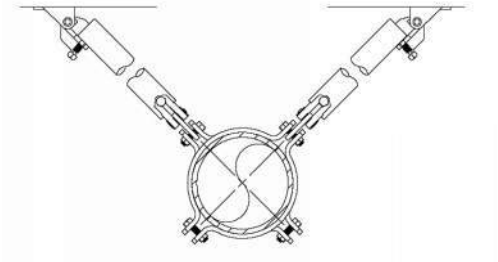
Finish — Plain

Note — Available in Electro-Galvanized and HDG finish.

Order By — Figure number, pipe size and finish.



Longitudinal Brace



4-Way Riser Brace
(Plan view)

Dimensions • Weights

Sizes	A	C	D	Bolt Size	Max. Rec. Load Lbs. (cULus)	*Max Design Load Lbs. (FM)	Approx. Wt./100
2½	6 7/16	2½	2¾	1/2	2015	3000	253
3	7	2¾	3 1/16	1/2	2015	1550	268
4	8½	3⅜	3 11/16	1/2	2015	1550	348
5	9¾	3⅞	4⅜	1/2	2015	1450	380
6	11½	5	5⅛	1/2	2015	1450	640
8	13¼	5⅝	5⅝	1/2	2015	1450	728

* The loads listed are axial loads on the brace. The horizontal load capacity, H, of the brace is: H = F x sin θ, where θ the installation angle measured from the vertical. FM approved when used with 1", 1¼", 1½" or 2" Sch. 40 brace pipe.

TOLCO® brand bracing components are designed to be compatible **ONLY** with other TOLCO® brand bracing components, resulting in a Listed seismic bracing assembly. **DISCLAIMER** — NIBCO does **NOT** warrant against the failure of TOLCO® brand bracing components, in the instance that such TOLCO® brand bracing components are used in combination with products, parts or systems which are not manufactured or sold under the TOLCO® brand. NIBCO shall **NOT** be liable under any circumstance for any direct or indirect, incidental or consequential damages of any kind, including but not limited to loss of business or profit, where non-TOLCO brand bracing components have been, or are used.

OFFICE/MANUFACTURING FACILITY • 1375 SAMPSON AVE. • CORONA, CA 92879 • PH: 951.737.5599 • FAX: 951.737.0330
CUSTOMER SERVICE • 800.786.5266
www.tolco.com

Fig. 906 - Sway Brace Multi-Fastener Adapter

Component of State of California OSHPD Approved Seismic Restraints System

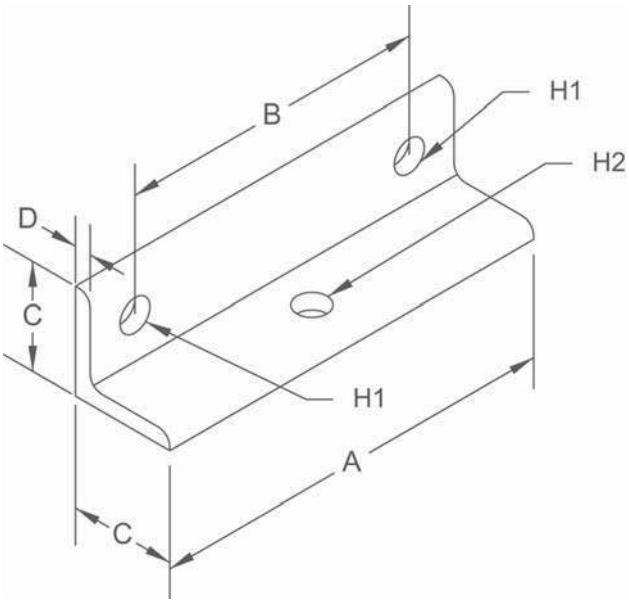
c UL US LISTED

Size Range — Use with 1" and 1¼" TOLCO UL listed Fig. 900 Series Earthquake Brace Attachments.

Material — Carbon Steel

Application — Allows sway brace fittings to develop greater load carrying ability by providing multiple fastener attachments. The National Fire Protection (NFPA) provides information on fastener loads to various structures. Refer to NFPA 13 (2010) 9.3.5.9.1.

Approvals — Underwriters Laboratories Listed in the USA **(UL)** and Canada **(cUL)** only when used with TOLCO 900 Series Earthquake Brace Attachments. Included in our Seismic Restraints Catalog 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 the TOLCO Seismic Restraint Systems Guidelines.



Installation Instructions — The Fig. 906 is a multiple fastener structural attachment component of a longitudinal or lateral sway brace assembly. It is intended to be combined with a TOLCO transitional attachment, "bracing pipe" and a TOLCO "braced pipe" attachment to form a complete bracing assembly. NFPA 13 and/or OSHPD guidelines should be followed.

T**o Install** — Attach the Fig. 906 to the structural surface as per fastener design guidelines. Attach other TOLCO transitional attachment fitting Fig. 909, 910, 980 or 986. Transitional fitting attachment can pivot for adjustment to proper brace angle.

Finish — Plain

Note — Available in Electro-Galvanized and HDG finish or Stainless Steel materials.

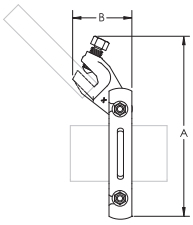
Order By — Figure number and specify dimensions H1 and H2.

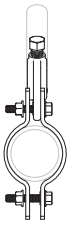
Dimensions • Weights

A	B	C	D	H1	H2	Approx. Wt./100
12	9	2	1/4	Specify	Specify	Varies

Easy Universal Sway Brace – CSBEZU0300EG

- Use for both lateral and longitudinal sway brace applications
- Unique slotted holes provide for easy slip-on installation eliminating loose hardware
- Snap-off bolt head helps enable easy installation and inspection of seismic sway braces
- Works with 1" through 2" brace pipes and 1/4" angle iron braces to reduce inventory
- Meets NFPA®-13 requirements for seismic sway bracing





Part Number	CSBEZU0300EG
Material	Steel
Finish	Electrogalvanized
Pipe Size	3"
A	9 3/8"
B	1 3/16"
Brace Pipe Size	1" – 2"
Certifications	cULus FM OSHPD
Standard Packaging Quantity	10 pc
UPC	78285663427
EAN-13	8711893057805

UL Loads (Listed for Restraints)			
Part Number	Dyna-Flow® Service Pipe	Sch 10 Service Pipe	Sch 40 Service Pipe
CSBEZU0100EG	N/A	655 lb	655 lb
CSBEZU0125EG	655 lb	655 lb	655 lb
CSBEZU0150EG	655 lb	655 lb	655 lb

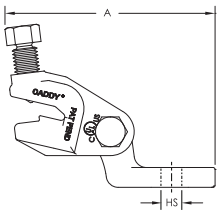
UL Loads (Listed for Sway Braces)								
Part Number	Lateral				Longitudinal			
	Dyna-Flow® Service Pipe	EZ FLOW™ Service Pipe	Sch 10 Service Pipe	Sch 40 Service Pipe	Dyna-Flow® Service Pipe	Mega-Flow Service Pipe	Sch 10 Service Pipe	Sch 40 Service Pipe
CSBEZU0200EG	3,000 lb	N/A	3,000 lb	3,000 lb	N/A	N/A	N/A	N/A
CSBEZU0250EG	3,000 lb	N/A	3,000 lb	3,000 lb	1,265 lb	N/A	1,265 lb	1,265 lb
CSBEZU0300EG	3,000 lb	N/A	3,000 lb	3,000 lb	1,265 lb	N/A	1,265 lb	1,265 lb
CSBEZU0400EG	3,000 lb	3,000 lb	3,000 lb	3,000 lb	1,265 lb	N/A	1,265 lb	1,265 lb
CSBEZU0500EG	N/A	3,000 lb	3,000 lb	3,000 lb	N/A	1,600 lb	1,600 lb	1,600 lb
CSBEZU0600EG	N/A	3,000 lb	3,000 lb	3,000 lb	N/A	1,600 lb	1,600 lb	1,600 lb

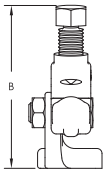
FM Loads (Lightwall, Sch 10 and Sch 40 Service Pipes)								
Part Number	Horizontal Capacity per Installation Angle from Vertical							
	Lateral				Longitudinal			
	30° - 44°	45° - 59°	60° - 74°	75° - 90°	30° - 44°	45° - 59°	60° - 74°	75° - 90°
CSBEZU0100EG	860 lb	1,220 lb	1,500 lb	1,670 lb	390 lb	550 lb	670 lb	750 lb
CSBEZU0125EG	860 lb	1,220 lb	1,500 lb	1,670 lb	390 lb	550 lb	670 lb	750 lb
CSBEZU0150EG	860 lb	1,220 lb	1,500 lb	1,670 lb	390 lb	550 lb	670 lb	750 lb
CSBEZU0200EG	1,530 lb	2,160 lb	2,650 lb	2,960 lb	520 lb	690 lb	830 lb	930 lb
CSBEZU0250EG	1,530 lb	2,160 lb	2,650 lb	2,960 lb	520 lb	690 lb	830 lb	930 lb
CSBEZU0300EG	1,530 lb	2,160 lb	2,650 lb	2,960 lb	520 lb	690 lb	830 lb	930 lb
CSBEZU0400EG	1,570 lb	2,220 lb	2,720 lb	3,030 lb	630 lb	900 lb	1,100 lb	1,230 lb
CSBEZU0500EG	1,570 lb	2,220 lb	2,720 lb	3,030 lb	630 lb	900 lb	1,100 lb	1,230 lb
CSBEZU0600EG	1,980 lb	2,810 lb	3,440 lb	3,840 lb	730 lb	1,000 lb	1,230 lb	1,370 lb

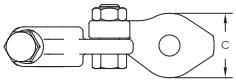
PENTAIR

Universal Structural Attachment

- Universal design allows one product to attach directly to concrete, wood, bar joist or I-beam adaptors
- Snap-off bolt head helps enable easy installation and inspection of seismic sway braces
- Use for both lateral and longitudinal sway brace applications
- Works with 1" through 2" brace pipes and 1/4" angle iron braces to reduce inventory
- Center bolt does not require tightening
- Meets NFPA®-13 requirements for seismic sway bracing







Material: Steel
Finish: Electrogalvanized

Part Number	Hole Size HS	A	B	C
CSBUNIV050EG	9/16"	5 1/4"	4"	1 5/8"
CSBUNIV075EG	13/16"	5 1/4"	4"	1 5/8"

UL Loads		
Brace Type	Service Pipe Size	Rating
Pipe	1" - 10"	3,000 lb
1/4" Thick Angle	1" - 8"	2,015 lb

FM Loads					
Brace Type	Service Pipe Size	Horizontal Capacity per Installation Angle from Vertical			
		30° - 44°	45° - 59°	60° - 74°	75° - 90°
Pipe	N/A	1,620 lb	2,300 lb	2,820 lb	3,140 lb

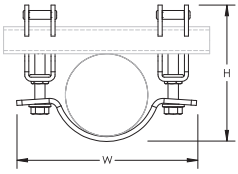
Quick Grip Lateral Sway Brace – CSBQG0400EG

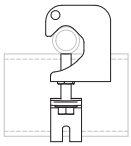




The Quick Grip Lateral Brace, part of the CADDY line of fire sprinkler bracing systems from Pentair, is designed to help simplify installations when bracing service pipe for seismic or other catastrophic events. It features an innovative design for quick attachment of brace pipe to service pipe saving time and money.

- Easy two-step installation elminates extra trips between structure and service pipe
- Works with 1" and 1 1/4" (25 mm and 32 mm) brace pipes to reduce inventory
- Yellow tips provide a visual indicator that the bolts have been properly torqued
- Easy installation with an impact wrench from the bottom side of the clamp
- Meets NFPA®-13 requirements for seismic sway bracing





Part Number	CSBQG0400EG
Material	Steel
Finish	Electrogalvanized
Pipe Size	4"
Height (H)	7 1/8" – 7 1/2"
Width (W)	8 3/4"
Certifications	cULus FM OSHPD
Standard Packaging Quantity	10 pc
UPC	78285671080
EAN-13	8711893138757

UL Loads			
Part Number	Service Pipe Schedule	Lateral	
		1" Brace Pipe	1 1/4" Brace Pipe
CSBQG0250EG	Dyna-Flow®	2,015 lb	2,015 lb
	10	2,015 lb	2,015 lb
	40	2,015 lb	2,015 lb
CSBQG0300EG	Dyna-Flow®	2,015 lb	2,015 lb
	10	2,015 lb	2,015 lb
	40	2,015 lb	2,015 lb
CSBQG0400EG	Dyna-Flow®	2,015 lb	2,015 lb
	10	2,015 lb	2,015 lb
	40	2,015 lb	2,015 lb
CSBQG0600EG	Mega-Flow	2,015 lb	2,015 lb
	10	2,015 lb	2,015 lb
	40	2,015 lb	2,015 lb
CSBQG0800EG	10	2,015 lb	2,015 lb
	40	2,015 lb	2,015 lb

FM Loads					
Part Number	Service Pipe Schedule	Lateral			
		Horizontal Capacity per Installation Angle from Vertical			
		30° - 44°	45° - 59°	60° - 74°	75° - 90°
CSBQG0250EG	Lightwall	1,410 lb	2,000 lb	2,450 lb	2,740 lb
	10	1,410 lb	2,000 lb	2,450 lb	2,740 lb
	40	1,410 lb	2,000 lb	2,450 lb	2,740 lb
CSBQG0300EG	Lightwall	1,190 lb	1,680 lb	2,060 lb	2,300 lb
	10	1,190 lb	1,680 lb	2,060 lb	2,300 lb
	40	1,190 lb	1,680 lb	2,060 lb	2,300 lb
CSBQG0400EG	Lightwall	1,190 lb	1,680 lb	2,060 lb	2,300 lb
	10	1,190 lb	1,680 lb	2,060 lb	2,300 lb
	40	1,190 lb	1,680 lb	2,060 lb	2,300 lb
CSBQG0600EG	Lightwall	870 lb	1,230 lb	1,510 lb	1,690 lb
	10	870 lb	1,230 lb	1,510 lb	1,690 lb
	40	970 lb	1,370 lb	1,680 lb	1,870 lb
CSBQG0800EG	0.188" (Wall Thickness)	790 lb	1,110 lb	1,360 lb	1,520 lb
	40	790 lb	1,110 lb	1,360 lb	1,520 lb

PENTAIR

Fire Protection Products, Inc.
3198 Lionshead Avenue
Carlsbad, CA 92010
Phone: (760) 599-1168
Fax: (800) 344-3775

MATERIAL SAFETY DATA SHEET

Last Updated: 03/20/12

Section 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PTFE THREAD SEALING TAPE

Manufacturer Information	Emergency Contact
Fire Protection Products, Inc. 3198 Lionshead Avenue Carlsbad, CA 92010 Phone: (760) 599-1168 Fax: (800) 344-3775	CHEMTREC 1300 Wilson Boulevard Arlington, VA 22209-2380 Phone: (800)424-9300 International: +1 (703) 527-3887

CAS Registry Number	2329433
Chemical Family	POLYFLON PTFE
Product Type	PTFE THREAD SEALING TAPE
Preparation/Revision Date	03/20/12

Section 2 — COMPOSITION/INFORMATION ON INGREDIENTS

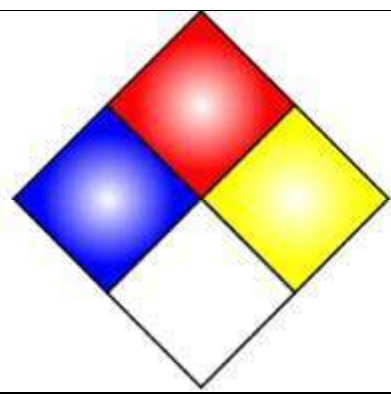
Component Name	CAS Number	OSHA PEL	ACGIH TLV	% (Optional)
Polytetrafluoroethylene	232943	N/A	N/A	

Section 3 — HAZARDS IDENTIFICATION

Principal Hazard(s)	**SUMMARY OF ACUTE HAZARDS:** None known **SUMMARY OF CHRONIC HAZARDS:** None known **MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:** None known

Section 4 — FIRST AID MEASURES

Oral	NONE KNOWN
Eye	N/A
Skin	N/A
Inhalation	If product is burned or heated above 500°F (260°C) and irritation or other respiratory distress occurs, remove to fresh air. If irritation persists, seek immediate medical attention.

Section 5	FIRE FIGHTING MEASURES	
Flash Point	N/A	
Upper Flammable Limit	N/A	
Lower Flammable Limit	N/A	
Extinguishing Media	Foam, CO_, water fog or water spray	
Special Firefighting Procedures	Wear self-contained breathing apparatus and other protective clothing. Evacuate area. Toxic decomposition products possible (see Section 10).	
Unusual Fire and Explosion Hazards	Product will emit phosgene fumes at high temperatures.	
Auto Ignition Temperature	N/A	
NFPA	Health: Flammability: Instability:	

Section 6	ACCIDENTAL RELEASE MEASURES
Personal Precautions	Keep away from sources of elevated temperature. Do not store near heat, sparks, or open flames. **OTHER PRECAUTIONS: KEEP OUT OF REACH OF CHILDREN.**
Environmental Precautions	N/A
Methods for Containment	N/A
Methods for Clean Up	N/A

Section 7	HANDLING AND STORAGE
Handling	N/A
Storage	Keep away from sources of elevated temperature. Do not store near heat, sparks, or open flames. **OTHER PRECAUTIONS: KEEP OUT OF REACH OF CHILDREN.**

Section 8	EXPOSURE CONTROLS/ PERSONAL PROTECTION
Engineering Controls	N/A
Personal Protection	Eye/Face Protection: N/A
	Skin Protection: N/A
	Respiratory Protection: N/A
General Measures	

Section 9	PHYSICAL AND CHEMICAL PROPERTIES
Physical State: Solid	**Vapor Density (Air =10): (AIR =1):** N/A
Appearance, Color, Odor: white solid/odorless	**Evaporation Weight:** EVAPORATION RATE (ETHYL ACETATE = 1): N/A
Specific Gravity: (H_20 = 1): 1.7	**Melting Point:** 617 - 626°F (325°C - 330°C)
Viscosity: N/A	**Boiling Point:** N/A
Odor Threshold: N/A	**% Volatile:** N/A
Water Solubility: N/A	**pH:** N/A
Vapor Pressure: (mm Hg): N/A	**Decomposition Temperature:** N/A
Addition Properties:	

Section 10	STABILITY AND REACTIVITY
Stability	STABLE
Incompatibility	(MATERIALS TO AVOID): Molten alkali metals
Conditions to Avoid	Temperatures > 500°F (260°C) without adequate ventilation
Polymerization	Will not occur
Hazardous Decomposition	At temperatures above 500°F (260°C), toxic fumes of phosgene are emitted.

Section 11	TOXICOLOGICAL INFORMATION
Oral Toxicity	N/A
Dermal Toxicity	N/A
Inhalation Toxicity	If product is burned or heated above 500°F (260°C) and irritation or other respiratory distress occurs, remove to fresh air. If irritation persists, seek immediate medical attention.
Chronic Toxicity	N/A
Respiratory Irritation	RESPIRATORY PROTECTION (SPECIFY TYPE): None. VENTILATION - LOCAL EXHAUST: Recommended when heated above 500° F(260°C).
Carcinogenicity	N/A
Other	N/A
Section 12	**ECOLOGICAL INFORMATION**
Ecotoxicity	Polytetrafluoroethylene
Degradability	N/A
Mobility	N/A
Section 13	**DISPOSAL CONSIDERATIONS**
Waste Disposal Method	Dispose of absorbed materials and liquid waste in accordance with all local, state, and federal regulations. DO NOT incinerate - burning produces toxic fumes

Section 14	TRANSPORT INFORMATION
US DOT Shipping Name	Not regulated
Hazard Class	N/A
DOT Identification Number	Non-Regulated
DOT Shipping Label	N/A
Canadian Transportation of Dangerous Goods:	Non-Regulated
Marine Pollutants	Non-Regulated

Section 15	REGULATORY INFORMATION
USA	
TSCA Inventory	N/A
SARA Title III	Sec. 302/304: N/A
	Sec. 311/312: N/A
	Sec. 313: N/A
	CERCLA RQ: N/A
California Prop 65	N/A
Canada	
WHMIS Classification (for workplace exposures)	N/A
New Substance Notification Regulations	N/A
NPRI Substances	N/A

Section 16	OTHER INFORMATION
Additional Information	
Prepared By	
Revised Date	March 20, 2012
Disclaimer	Although the information and recommendations set forth herein are presented in good faith and believed to be correct as of the date hereof, **Fire Protection Products, Inc.** makes no representations as to the completeness or accuracy thereof. **Fire Protection Products, Inc.** makes no warranty whatsoever, expressed or implied, of merchantability or fitness for the particular purpose since the conditions of use are beyond our control. **Fire Protection Products, Inc.** assumes no responsibility for injury to recipient or to third persons for any damage to any property and recipient.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS)

Health = Fire = Reactivity = PP =

Rating: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Extreme

tyco / Fire & Building Products

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

BlazeMaster®
TFP-500 One Step Solvent Cement
MSDS (Material Safety Data Sheet)

Date Revised: AUG 2007
Supersedes: APR 2007

TYCO

MATERIAL SAFETY DATA SHEET

Information on this form is furnished solely for the purpose of compliance with the U.S. Occupational Safety and Health Act , the Canadian Hazardous Products Act and Controlled Products Regulations and shall not be used for any other purpose. IPS Corporation urges the customers receiving this Safety Data Sheet to study it carefully to become aware of the hazards, if any, of the product involved. In the interest of safety, you should notify your employees, agents and contractors of the information on this sheet.

SECTION I - PRODUCT INFORMATION

MANUFACTURER'S NAME
IPS Corporation for Tyco
ADDRESS
17109 S. Main St., P.O. Box 379,
Gardena, CA. 90248 U.S.A. (310) 898-3300

SUPPLIER'S NAME
Tyco Fire and Building Products
ADDRESS
451 North Cannon Avenue
Lansdale, PA 19446, USA

Transportation Emergencies:
CHEMTREC: (800) 424-9300
Medical Emergencies:
3 E COMPANY (24 Hour No.) (800) 451-8346
Business: Tyco (215) 362-0700

CHEMICAL NAME and FAMILY
Mixture of CPVC Resin and Organic Solvents

TRADE NAME:
BLAZEMASTER® TFP 500 Low VOC Cement for CPVC Plastic Pipe

SECTION II - HAZARDOUS INGREDIENTS, EXPOSURE LIMITS, TRANSPORT & WHMIS DATA

None of the ingredients below are listed as carcinogens by IARC, NTP, OSHA or ACGIH.	CAS#	APPROX % BY WEIGHT	ACGIH TLV	ACGIH STEL	OSHA PEL	OSHA STEL	LD50	LC50	DUPONT (A) AEL	DUPONT (B) STEL
Chlorinated Polyvinyl Chloride Resin (CPVC)	68648-82-8	10 - 20	N. AP.		N. AP.		N. AP.	N. AP.		
Tetrahydrofuran (THF), Stabilized	109-99-9	30 - 60	50 PPM Skin	100 PPM Skin	200 PPM	250 PPM	Oral: 2880 mg/kg (rat)	Inhalation 3 hrs. 21,000 PPM (rat)	50 PPM	75 PPM
Methyl Ethyl Ketone (MEK)	78-93-3	3 - 7	200 PPM	300 PPM	200 PPM	300 PPM	Oral: 3.98 g/kg (rat) Dermal: 8-10 mg/kg (rabbit)	Inhalation 4 hrs. 4,000 PPM (rat)		
Cyclohexanone	108-94-1	1 - 5	20 PPM Skin		50 PPM		Oral: 1900 mg/kg (rat) Dermal: 1.0 g/kg (rabbit)	, Inhalation LCLO, 4 hrs: 2000 PPM rat)		
Acetone	67-64-1	7 - 13	500 PPM	750 PPM	750 PPM	1000 PPM	Oral: 9.75 g/kg (rat) Dermal: 20 g/kg (rabbit)	Inhalation LCLO 4 hrs: 16,000 PPM (rat)		

All of the constituents of IPS adhesive products are listed on the TSCA inventory of chemical substances maintained by the US EPA and/or the Canadian Domestic Substance List (DSL), or are exempt from such listings.

(A) Dupont and BASF mfg's Acceptable Exposure Limit (AEL) guidelines for 8 hour and 12 hour TWA, (B) Dupont/BASF recommended STEL for 15 minute TWA.

DOT, IATA, IMO/IMDG SHIPPING INFORMATION

Proper Shipping Name:	Adhesives
Hazard Class:	3
Identification Number:	UN 1133
Packing Group:	II
Label Required:	Flammable Liquid

EXCEPTION: Case quantities of cement in containers of less than one liter may be shipped as LIMITED QUANTITY or CONSUMER COMMODITY, ORM-D

TDG INFORMATION

TDG CLASS:	FLAMMABLE LIQUID 3
SHIPPING NAME:	ADHESIVES (TETRAHYDROFURAN)
UN NUMBER:	1133, PG II

WHMIS CLASSIFICATION: CONTROLLED PRODUCT
CLASS B, DIVISION 2
CLASS D, DIVISION 2B

SPECIAL HAZARD DESIGNATIONS

	HMIS	NFPA	HAZARD RATING
HEALTH:	2	2	0 - MINIMAL
FLAMMABILITY:	3	3	1 - SLIGHT
REACTIVITY:	0	1	2 - MODERATE
PROTECTIVE EQUIPMENT:	B - H		3 - SERIOUS 4 - SEVERE

B = Eye, Hand/Skin (for normal solvent-welding activities)
H = Eye, Hand/Skin, Respiratory Protection and Impermeable Apron (splash/ immersion risks)

SECTION III - PHYSICAL DATA

APPEARANCE
Red, medium syrupy liquid

ODOR
Ethereal (Threshold = 2-50 PPM)

BOILING POINT (°F/°C) **FREEZING POINT**
133°F (57°C) -139°F (-95°C)
Based on Acetone

SPECIFIC GRAVITY @ 73°F ± 3.6° (23°C ± 2°)
Typical 1.0 ± 0.040

VAPOR PRESSURE (mm Hg.)
190 mm Hg. based on first boiling component, Acetone @ 68°F (20°C)

PERCENT VOLATILE BY VOLUME (%)
Approx: 70 - 80 %

VAPOR DENSITY (Air = 1)
2.49

EVAPORATION RATE (BUAC = 1)
> 1.0

SOLUBILITY IN WATER
Solvent portion completely soluble in water.
Resin portion separates out.

COEFFICIENT OF WATER/OIL DISTRIBUTION
N. AV.

PH INFORMATION
N. AP.

VOC STATEMENT Maximum VOC emissions as applied and tested per SCAQMD Rule 1168, Test Method 316A: 490 grams/liter. After drying and curing there are negligible or no emissions.

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	AUTO IGNITION TEMP.	FLAMMABLE LIMITS	LEL	UEL
-6°F (-21°C) T.C.C. Based on Acetone	609.8°F (321°C), THF	(PERCENT BY VOLUME)	2.0	11.8

FIRE EXTINGUISHING MEDIA

Ansul "Purple K" potassium bicarbonate dry chemical, any appropriately sized ABC dry chemical, carbon dioxide or foam extinguisher can be used for small fires.
Use of a water fog by trained personnel can extinguish small/large fires.

SPECIAL FIRE FIGHTING PROCEDURES

Evacuate enclosed areas. Stay upwind. Close quarters or confined spaces require self-contained breathing apparatus, positive pressure mask or airline mask.
Use of a water fog by trained personnel can extinguish small/large fires and avoid water flow or water streams/spray distributing burning material or contaminated water over a large area or into sewers or storm drains. Use water spray to cool containers, to flush spills from source of ignition and to disperse vapors.

UNUSUAL FIRE AND EXPLOSION HAZARDS **SENSITIVITY TO MECHANICAL IMPACT: N. AP** **SENSITIVITY TO STATIC DISCHARGE: 0.25 Millijoules**

Fire hazard because of low flash point and high volatility. Vapors are heavier than air and may travel to source(s) of ignition at or near ground or lower level(s) and flash back.
Refer to Section V for hazardous decomposition products.

Hazardous Combustion Products When forced to burn, this product gives out carbon monoxide, carbon dioxide, hydrogen chloride and smoke. *fff*-dC

SECTION V - REACTIVITY DATA

STABILITY			CONDITIONS TO AVOID
	UNSTABLE		Keep away from heat, sparks, open flame and other sources of ignition.
	STABLE	X	

INCOMPATIBILITY
(MATERIALS TO AVOID) Caustics, ammonia, inorganic acids, chlorinated compounds, strong oxidizers and isocyanates.

HAZARDOUS DECOMPOSITION PRODUCTS
When exposed to the air, this product gives off flammable vapors/volatile organic compounds. Refer to Section IV.

HAZARDOUS POLYMERIZATION			CONDITIONS TO AVOID
	MAY OCCUR		Keep away from heat, sparks, open flame and other sources of ignition.
	WILL NOT OCCUR	X	

SECTION VI - HEALTH HAZARD DATA & TOXICOLOGICAL PROPERTIES

PRIMARY ROUTES OF ENTRY: ___X___ Inhalation ___X___ Skin Contact _____ Eye Contact _____ Ingestion

TOXIC EXPOSURE VALUES *Refer to table in Section II for indications of carcinogenicity and Lethal Dose and Lethal Concentration exposure values*
EFFECT OF OVEREXPOSURE
ACUTE:

Inhalation: Severe overexposure may result in nausea, dizziness, headache. Can cause drowsiness, irritation of eyes and nasal passages.
Skin Contact: Skin irritant. Liquid contact may remove natural skin oils resulting in skin irritation. Dermatitis may occur with prolonged contact.
Skin Absorption: Prolonged or widespread exposure may result in the absorption of harmful amounts of material.
Eye Contact: Overexposure may result in severe eye injury with corneal or conjuctival inflammation on contact with the liquid. Vapors slightly uncomfortable.
Ingestion: Moderately toxic. May cause nausea, vomiting, diarrhea. May cause mental sluggishness.
CHRONIC: Symptoms of respiratory tract irritation and damage to respiratory epithelium were reported in rats exposed to 5000 ppm THF for 90 days. Elevation of SGPT suggests a disturbance in liver function. The NOEL was reported to be 200 ppm.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Individuals with pre-existing diseases of the eyes, skin or respiratory system may have increased susceptibility to the toxicity of excessive exposures.

REPRODUCTIVE EFFECTS	TERATOGENICITY	MUTAGENICITY	EMBRYOTOXICITY	SENSITIZATION TO PRODUCT	SYNERGISTIC PRODUCTS
N. AP.	N. AP.	N. AP.	N. AP.	N. AP.	N. AV.

SECTION VII - PREVENTIVE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Eliminate all ignition sources. Avoid breathing of vapors. Keep liquid out of eyes. Flush with large amount of water. Contain liquid with sand or earth. Absorb with sand or nonflammable absorbent material and transfer into steel drums for recovery or disposal. Prevent liquid from entering drains.

WASTE DISPOSAL METHOD

Follow local, State and Federal regulations. Consult disposal expert. Can be disposed of by incineration. Excessive quantities should not be permitted to enter drains. Empty containers should be air dried before disposing. CA Hazardous Waste Code: 214.

RESPIRATORY PROTECTION (Specify type)

Atmospheric exposure levels in employees' breathing zone should be maintained below established exposure limits contained in Section II. If airborne concentrations exceed those limits, use of a NIOSH approved organic vapor cartridge respirator with full face-piece is recommended. The effectiveness of an air purifying respirator is limited. Use it only for a single short-term exposure. For emergency and other conditions where short-term exposure guidelines may be exceeded, use an approved positive pressure air line or self-contained breathing apparatus.

VENTILATION

Use only with adequate ventilation. Provide sufficient ventilation in volume and pattern to keep contaminants below applicable exposure limits set forth in Section II.
Use only explosion proof ventilation equipment.

PROTECTIVE GLOVES PVA coated rubber gloves for frequent dipping/immersion. Use of latex/nitrile surgical gloves or solvent resistant barrier creme should provide adequate protection when normal solvent-cement welding practices and procedures are used for making plastic welded pipe joints.

EYE PROTECTION Splashproof chemical goggles, face shield, safety glasses with brow guards and side shields, etc. as appropriate for exposure.

OTHER PROTECTIVE EQUIPMENT AND HYGIENIC PRACTICES

Impervious apron and a source of running water to flush or wash the eyes and skin in case of contact.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store in the shade between 40°F - 90°F (5°C - 32.5°C). Keep away from heat, sparks, open flame and other sources of ignition. Avoid prolonged breathing of vapor.
Use with adequate ventilation. Avoid contact with eyes, skin and clothing. Train employees on all special handling procedures before they work with this product.

OTHER PRECAUTIONS

Follow all precautionary information given on container label, product bulletins and our solvent cementing literature. All material handling equipment should be electrically grounded.

SECTION VIII - FIRST AID MEASURES

EMERGENCY AND FIRST AID PROCEDURES

Inhalation:	If overcome by vapors, remove to fresh air and if breathing stopped, give artificial respiration. If breathing is difficult, give oxygen. Call physician.
Eye Contact:	Flush eyes with plenty of water for 15 minutes and call a physician.
Skin Contact:	Remove contaminated clothing and shoes. Wash skin with plenty of soap and water for at least 15 minutes. If irritation develops, get medical attention.
Ingestion:	Give 1 or 2 glasses of water or milk. Do not induce vomiting. Call physician or poison control center immediately.

SECTION IX - SDS PREPARATION INFORMATION

Prepared 22 Aug 2007 by: IPS Safety, Health & Environmental Affairs Department
Telephone number: (310) 898-3300
e-mail address <richard.winn@ipscorp.com>

ƒƒƒ-dC

INTUMESCENT ACRYLIC FIRESTOP SEALANT

BlazeMaster®

CAULK & WALK®

OVERVIEW

BlazeMaster® Caulk & Walk® is an intumescent, acrylic-based firestopping sealant for use in fire-rated building construction. It is specifically designed to be compatible with BlazeMaster® CPVC fire sprinkler systems. Manufactured by Tremco, Inc., a leading provider of sealants for use in construction, BlazeMaster® Caulk & Walk® is listed for use where CPVC pipe penetrates fire-rated assemblies. BlazeMaster® Caulk & Walk® has been tested for penetrations through 1 and 2 hour rated gypsum wallboard assemblies, 2 hour concrete assemblies and 1 hour wood frame assemblies. BlazeMaster® Caulk & Walk® has also been tested for metallic pipe penetrations which enables the product to be utilized for firestopping when pipe transitions are employed.

ABOUT COMPATIBILITY

BlazeMaster® CPVC fire sprinkler systems have been used successfully for more than 16 years in building construction and renovation. BlazeMaster® systems are ideally suited for use in fire protection primarily due to their ease of installation, outstanding corrosion resistance, low flame spread and low smoke characteristics. These properties can however be compromised if the CPVC pipe comes in contact with incompatible chemicals found in some construction products.

2 Hour Fire Rated Through Penetration Firestop for Single Plastic Pipe through Concrete Floors or Walls using BlazeMaster® Caulk & Walk.®

1 or 2 Hour Fire Rated Through Penetration Firestop for Single Plastic Pipe through Gypsum Walls using BlazeMaster® Caulk & Walk.®

One area where these incompatibilities can be found is in firestopping sealants. Certain firestopping sealants within the industry contain chemicals that are incompatible with CPVC piping systems. These chemicals can cause the wall of the CPVC pipe to weaken and may even cause environmental stress fractures. BlazeMaster® Caulk & Walk® is a specially formulated firestopping sealant made to ensure that a chemically induced failure will not occur when used with BlazeMaster® CPVC fire sprinkler systems.

FEATURES

- Compatible with BlazeMaster® CPVC piping systems
- UL/cUL Listed
- User friendly - Easy to install
- Paintable
- Tested to ASTM E814 (UL 1479) and CAN4-S115
- Available in Rust Red
- Graphite-based intumescent properties
- Available in 300 ml tubes and 5 gallon pails

UL SYSTEM RATINGS

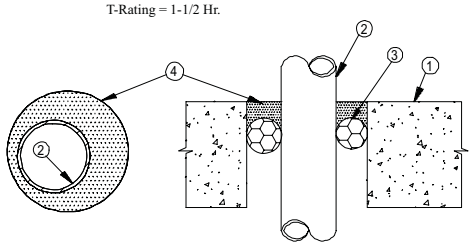
	PENETRATING ITEM	CONCRETE	GYPSUM	WOOD FRAME
PLASTIC PIPE	CPVC	C-AJ-2221	W-L-2151	F-C-2199
	PVC	C-AJ-2221	W-L-2151	F-C-2199
METALLIC PIPE		C-AJ-1304	W-L-1147	F-C-1083
INSULATED PIPE	Fiberglass	C-AJ-5181	W-L-5155	F-C-5047
	AB/PVC	N/A	W-L-5154	F-C-5047

CONCRETE ASSEMBLIES

2 Hour Fire Rated Through Penetration Firestop for Single Plastic Pipe through Concrete Floors or Walls using BlazeMaster® Caulk & Walk.®

Drawing not to scale

F-Rating = 2 Hr.
T-Rating = 1-1/2 Hr.



① Pre-Rated Concrete Floors or Block Walls = Min. 4-1/2" thickness

② Plastic Pipe - A) Nom. 2" diam. (or smaller) Sch. 40 PVC pipe.
B) Nom. 2" diam. (or smaller) CPVC pipe.
The annular space range shall be min. 1/4" to max. 3/8".
NOTE: For use in closed (process or supply) piping systems.

③ Forming Material - (Optional) Foam backer rod packed into the opening as a permanent form.

④ BlazeMaster® Caulk & Walk® - Min. 1/2" thickness of sealant applied within opening, flush top surface of floor or both surfaces of wall assembly.

UL/cUL System No. CAJ 2221

Project: _____
Location: _____
Installer: _____
Signature: _____

The Tremco products used above have been tested in accordance with the following:
• ASTM E814 (UL1479) Standard Test Method for Through Penetration Firestopping.

Date: 10/29/01 | Drawing: BCW-2221
Approved by: J. Pitcole

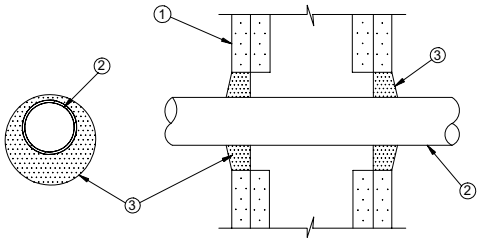
This information is intended for engineering purposes only and is based on internal and third party testing which we believe to be accurate. The user of this information must determine the suitability of the design to the application and the product to local building codes. Tremco shall not be liable for damages, direct or consequential, resulting from use of this material or design. Tremco shall only be responsible for replacing material found to be defective.

GYPSUM WALL ASSEMBLIES

1 or 2 Hour Fire Rated Through Penetration Firestop for Single Plastic Pipe through Gypsum Walls using BlazeMaster® Caulk & Walk.®

Drawing not to scale

F-Rating = 1 & 2 Hr.
T-Rating = 1 & 2 Hr.



① Pre-Rated Gypsum Wallboard/Stud Wall Assembly
A) The F-Rating = 1 hour if there is one layer of gypsum wallboard.
B) The F-Rating = 2 hours if there are two layers of gypsum wallboard.

② Plastic Pipe - A) Nom. 2" diam. (or smaller) Sch. 40 PVC pipe.
B) Nom. 2" diam. (or smaller) CPVC pipe.
The annular space range shall be min. 1/4" to max. 1-3/8".
NOTE: For use in closed (process or supply) piping systems.

③ BlazeMaster® Caulk & Walk® - Min. 1/2" thickness of sealant applied within opening. Additional sealant to be installed such that a min. 1/4" crown is formed around the penetrating item.

NOTE: The F & T ratings of the system is equal to the fire rating of the wall assembly.

UL/cUL System No. WL 2151

Project: _____
Location: _____
Installer: _____
Signature: _____

The Tremco products used above have been tested in accordance with the following:
• ASTM E814 (UL1479) Standard Test Method for Through Penetration Firestopping.

Date: 10/29/01 | Drawing: BCW-2151
Approved by: J. Pitcole

This information is intended for engineering purposes only and is based on internal and third party testing which we believe to be accurate. The user of this information must determine the suitability of the design to the application and the product to local building codes. Tremco shall not be liable for damages, direct or consequential, resulting from use of this material or design. Tremco shall only be responsible for replacing material found to be defective.

Lubrizol

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Cleveland, Ohio 44141-3201 USA
216-447-5000
888-234-2436
Fax: 216-447-5750

For technical questions about installation and use please contact Tremco, Inc. 800-321-7906

Manufactured by TREMCO
Information: 216-292-5000 800-321-7906

Printed in USA 07/07 BMCW

SAFETY DATA SHEET

Section 1: Product and Company Identification

Product Name: LA-CO Premium All Purpose Cutting Oil

Product Code: 73413 (1 qt.), 73414 (1 gal.), 73415 (5 gal.), 73469 (55 gal)

Product Use: Cutting Oil

Manufacturer: LA-CO Industries, Inc.
1201 Pratt Boulevard
Elk Grove Village, IL.
60007-5746
E-mail Contact: customer_service@laco.com

Phone Number: (847) 956-7600
Fax: (847) 956-9885
24-hour Emergency: **CHEMTREC: (800) 424-9300**

Section 2: Hazards Identification

Protective Equipment	GHS Classification	WHMIS (Canada)	Transport
	**Not classified as a hazardous chemical**	**Not Controlled**	**Not Regulated**

Emergency Overview: Product may burn when heated or if involved in a fire. Prolonged contact with skin may cause irritation. Contact with the eyes may cause mild irritation.

Appearance, Color and Odor: black colored liquid with a bland odor.

USA: This product is not a hazardous chemical as defined by 29 CFR1910.1200, OSHA Hazard Communication Standard.

Canada: This is not a controlled product under WHMIS.

European Union (EU): This product is not classified as dangerous/hazardous according to according to Regulation (EC) No 1272/2008.

While this product is not considered hazardous, this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Potential Health Effects: **ACUTE (short term): see Section 8 for exposure controls**

Relevant Route(s) of Exposure: Skin, eye contact.

Inhalation: Inhalation is not expected with normal use. Extreme heating of the product can release irritating vapors. Mists generated during use may cause irritation. Symptoms of irritation include coughing, sneezing, nasal discharge, headache, hoarseness and pain in the upper respiratory tract.

Ingestion: Components of the product have low oral toxicity. May cause nausea, vomiting and diarrhea if swallowed.

Skin: Prolonged contact with the skin may cause mild irritation and defatting of the skin.

Eye: Direct eye contact causes mild irritation.
CHRONIC (long term): see Section 11 for additional toxicological data

Prolonged or repeated skin contact may cause dermatitis.

Medical Conditions Aggravated by Exposure: Skin contact may aggravate an existing dermatitis.

Interactions With Other Chemicals: May react with strong oxidizing agents.

Potential Environmental Effects: Not available

SAFETY DATA SHEET

Section 3: Composition / Information on Ingredients

Hazardous Ingredients:

Chemical Name	CAS No.	Wt.%	EINECS / ELINCS	Symbol	Risk Phrases
Distillates (petroleum), hydrotreated heavy naphthenic	64742-52-5	60 - 100	265-155-0	Not applicable contains <3% DMSO extract by IP 346	

Section 4: First Aid Measures

Inhalation: If symptoms are experienced remove source of contamination or move victim to fresh air and obtain medical advice.

Eye Contact: If irritation occurs, flush contaminated eye(s) with lukewarm, gently flowing water for 5 minutes. If irritation persists, obtain medical advice.

Skin Contact: If irritation does occur, wash with soap and lukewarm, gently flowing water. If irritation persists, obtain medical advice.

Ingestion: Never give anything by mouth if victim is rapidly losing consciousness, or is unconscious or convulsing. DO NOT INDUCE VOMITING. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Quickly transport victim to an emergency care facility.

Section 5: Fire Fighting Measures

Flammable Properties: Product can burn if strongly heated. Liquid can float on water and may travel to distant locations and/or spread fire.

Suitable extinguishing Media: Carbon dioxide, dry chemical powder, appropriate foam, water fog. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates.

Unsuitable extinguishing Media: Straight water streams may cause spattering of hot, combustible liquid and may spread the fire.

Explosion Data:
Sensitivity to Mechanical Impact: Not applicable

Sensitivity to Static Discharge: Not available

Specific Hazards arising from the Chemical: Thermal decomposition products are highly dependent on fire conditions. During a fire, irritating and/or toxic substances, such as sulfur, nitrogen and phosphorus oxides, reactive hydrocarbons and polycyclic aromatic hydrocarbons (PAHs). Containers may rupture violently when exposed to fire or excessive heat for sufficient time.

Protective Equipment and precautions for firefighters: Self-contained breathing apparatus and protective clothing should be worn. Remove all unprotected personnel. Move containers from fire area if you can do it without risk.

Section 6: Accidental Release Measures

Personal Precautions: Wear adequate personal protective equipment as indicated in Section 8. Spilled product may pose a slipping hazard.

Environmental Precautions: Minimize entry of material into sewers and drainage systems.

Methods for Containment: Contain spill immediately using a suitable inert absorbent material.

Methods for Clean-up: Scrape or scoop product and absorbent and place in a secure container for proper disposal.

SAFETY DATA SHEET

Section 7: Handling and Storage

Handling: Avoid contact with eyes and skin; do not breathe in fumes or mists. Wash thoroughly with detergent and water after handling, before eating, drinking, smoking or using the toilet. Remove contaminated clothing and wash before reuse. Keep out of reach of children.

Storage: Store in a cool, dry area, out of direct sunlight and away from heat, flames and ignition sources. Store away from strong oxidizing materials. Keep containers closed when not in use.

Section 8: Exposure Controls/Personal Protection

Exposure Guidelines

Some component substances in this preparation have Occupational Exposure Limits/Guidelines. Exposure to airborne component substances is not expected with anticipated conditions of use. Consult local authorities for acceptable exposure limits.

Ingredient	ACGIH TLV (8-hr. TWA) mg/m^3	U.S. OSHA PEL (8-hr. TWA) mg/m^3	Ontario(Canada) TWAEV mg/m^3
Mineral Oil, mist	5	5	5 / 10 STEV

Exposure Controls

Engineering Controls: If product is heated or if a mist is formed during use, provide adequate exhaust ventilation to keep airborne concentrations below the exposure limits listed above.

Personal Protection: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 529 or Canadian Standards Association (CSA) Standard Z94.4-02 must be followed whenever workplace conditions warrant a respirator's use.

Respiratory Protection: Not required for normal use.

Eye/Face Protection: Wear safety glasses with side shields.

Skin Protection: Wear protective gloves made of neoprene rubber or other material resistant to petroleum distillates. Wear boots, apron and body-covering clothing when needed to prevent skin contact.

Other Protective Equipment: Not required for normal use.

General Hygiene Measures: Avoid breathing fumes generated from heated product. Do not eat, drink or smoke in work areas. Wash hands after handling this product.

Section 9: Physical and Chemical Properties

Physical State:	Liquid	**Flash Point & method:**	150°C (300°F)
Appearance, Color and Odor:	Black, bland odor	**Autoignition Temperature:**	Not available
Odor Threshold:	Not available	**Flammability Limits in Air:**	Not available
pH:	Not applicable	**Vapor Pressure:**	<0.001 mm Hg @20°C (68°F)
Relative density: (water = 1)	0.89	**Vapor Density: (Air = 1)**	>5.0
Partition coefficient: (n-octanol/water)	Not available	**Evaporation Rate: (n-Butyl Acetate = 1)**	Not available
Solubility:	Insoluble in water.	**Boiling Point/Range:**	>260°C (>500°F)
Viscosity:	108.2 SUS @ 37°C (100°F)	**Melting Point:**	Not available
Decomposition Temperature:	Not available	**VOC Content:**	Not available

SAFETY DATA SHEET

Section 10: Stability and Reactivity

Chemical Stability: Stable at normal room temperature.

Conditions to Avoid: Avoid extreme heat and open flames.

Incompatible Materials: Incompatible with strong oxidizers.

Hazardous Decomposition Products: When heated to decomposition irritating and toxic vapors may be generated.

Possibility of Hazardous Reactions: Not available

Section 11: Toxicological Information

Acute Toxicity Data

	LD_{50} Oral (mg/kg)	LD_{50} Dermal (mg/kg)	LC_{50} Inhalation (4 hrs.)
Distillates (petroleum), hydrotreated heavy naphthenic	>5 000 (rat)	>2 000 (rabbit)	2 180 mg/m^3 (rat)

Other Toxicity Data:

Carcinogenicity: Distillates (petroleum), have less than 3% DMSO extract as measured by IP 346. This product is not required to be labeled according to the European Directive 67/548/EEC.
Normal use of this product will not result in exposure to any component that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists, OSHA or NTP (National Toxicology Program).

Irritation: Normal use may cause mild skin irritation in some individuals.
In a study conducted according to OECD guidelines, application of 0.5 mL undiluted hydrotreated heavy naphthenic distillate to intact or damaged skin for 24 hours caused very mild irritation in rabbits (primary dermal irritation score: 1.3/8).
Causes mild eye irritation; irritation is expected to be reversible.
In a study conducted according to OECD guidelines, application of 0.1 mL of undiluted hydrotreated heavy naphthenic distillate caused very mild irritation in rabbits (primary irritation score: 4.5/110 (at 1 hour); 1.3/110 (at 24 hours)). These effects reversed within 48 hours.

Corrosivity: Not applicable.

Sensitization: In a closed patch test using guinea pigs, conducted according to OECD guidelines, hydrotreated heavy naphthenic distillate did not cause skin sensitization.

Neurological Effects: Not available

Genetic Effects: Not available

Reproductive Effects: Not available

Developmental Effects: Not available

Target Organ Effects: Not available

Section 12: Ecological Information

Ecotoxicity: Petroleum distillates can have adverse effects on aquatic ecosystems.

Persistence/Degradability: Product is not readily biodegradable.

Bioaccumulation/Accumulation: Not available

Mobility: Not available

SAFETY DATA SHEET

Section 13: Disposal Considerations

Waste Disposal Method: Do NOT dump into any sewers, on the ground or into any body of water. Store material for disposal as indicated in Section 7 Handling and Storage.
The conditions of use, storage and disposal of this product are beyond our control and may be beyond our knowledge. For this and other reasons, LA-CO Industries, Inc. does not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of this product.

USA: Dispose of in accordance with local, state and federal laws and regulations.

Canada: Dispose of in accordance with local, provincial and federal laws and regulations.

EU: Waste must be disposed of in accordance with relevant EU Directives and national, regional and local environmental control regulations. For disposal within the EU, the appropriate code according to the European Waste Catalogue (EWC) should be used.

Section 14: Transport Information:

U.S. Hazardous Materials Regulation (DOT 49CFR): Not regulated

Canadian Transportation of Dangerous Goods (TDG): Not regulated

ADR/RID: Not regulated

IMDG: Not regulated

ICAO/IATA: Not regulated

Section 15: Regulatory Information

USA

TSCA Status: Listed on the TSCA inventory.

SARA Title III
Sec. 302/304: None
Sec: 311/312: Not applicable
Sec. 313: Not applicable
CERCLA RQ: Not applicable

Canada

This product has been classified in accordance with the hazard criteria of the *Controlled Products Regulations* and the SDS contains all the information required by the *Controlled Products Regulations*.

WHMIS Classification: (for workplace exposures) Not controlled

New Substance Notification Regulations: All ingredients in the product are listed, as required, on Canada's Domestic Substances List (DSL).

NPRI Substances: Not applicable

European Union

European Inventories: Distillates (petroleum), hydrotreated heavy naphthenic; 265-155-0

This product is not classified as hazardous.

SAFETY DATA SHEET

Section 16: Other Information

Preparation Information:

Revision Date: May 30, 2012

Revision Summary: August 17, 2009: Original.
May 30, 2012 SDS review, no revisions.

Supplier Note: The information contained herein is based on data available to us and is accurate and reliable to the best of our knowledge and belief. However, LA-CO Industries, Inc. makes no representations as to its completeness or accuracy. Information is supplied on condition that persons receiving such information will make their own determination as to its suitability for their purposes prior to use. In no event will LA-CO Industries, Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon the information contained herein.

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