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A Fire

Sprinkler

Corporation

Fire Protection Sprinkler System
**Hydraulic Calculations,
Material Submittals,
&
Operation & Maintenance Manuals**

FOR

**East Town Crossing Apartments
2909 E PIONEER
PUYALLUP, WA 98372**

EMERGENCY INFORMATION

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2709 Jahn Ave. NW #H-2

Gig Harbor, WA 98335

Phone 253.853.7780

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www.SprinxFire.com

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SUPPLIER INFORMATION

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



TECHNICAL DATA

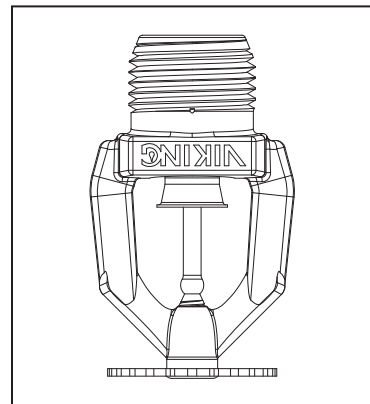
FREEDOM® RESIDENTIAL PENDENT SPRINKLER VK468 (K4.9)

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



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)

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.)

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.



TECHNICAL DATA

FREEDOM® RESIDENTIAL PENDENT SPRINKLER VK468 (K4.9)

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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

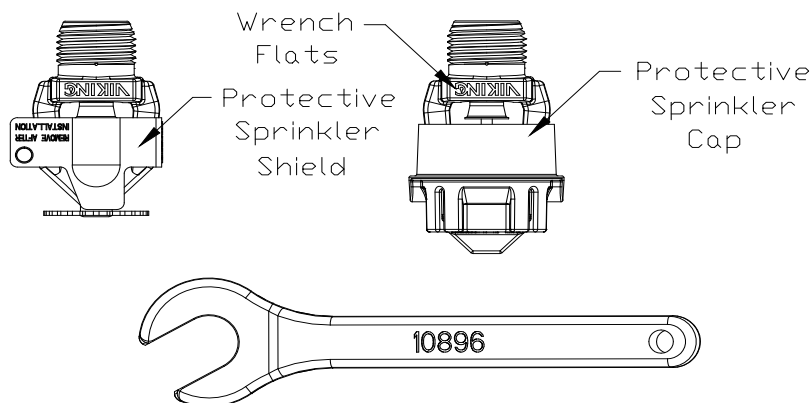
Corrosion Resistant Coatings³: ENT

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.





TECHNICAL DATA

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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. Ft. (m)
	Flow ⁴ GPM (L/min)	Pressure ⁴ PSI (bar)	Flow ⁴ GPM (L/min)	Pressure ⁴ PSI (bar)			 ⁵	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 sur- face-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 Foot- notes 7 and 10.	See Foot- note 7.	See Foot- note 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 Polyester⁹

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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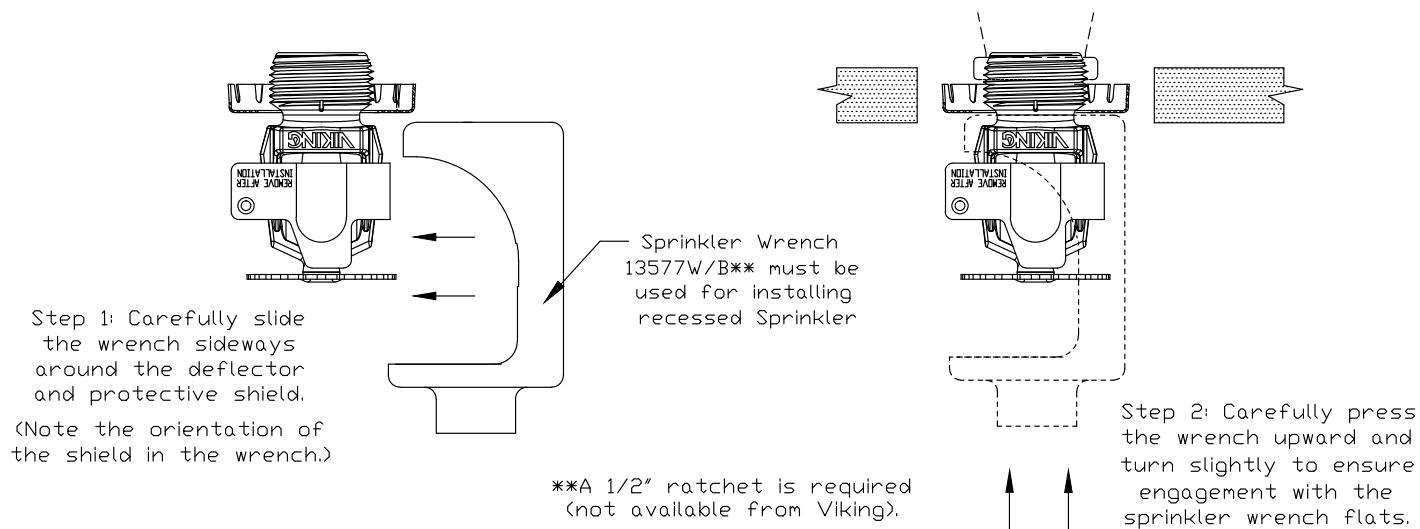


Figure 2: Wrench 13577W/B for Recessed Sprinkler

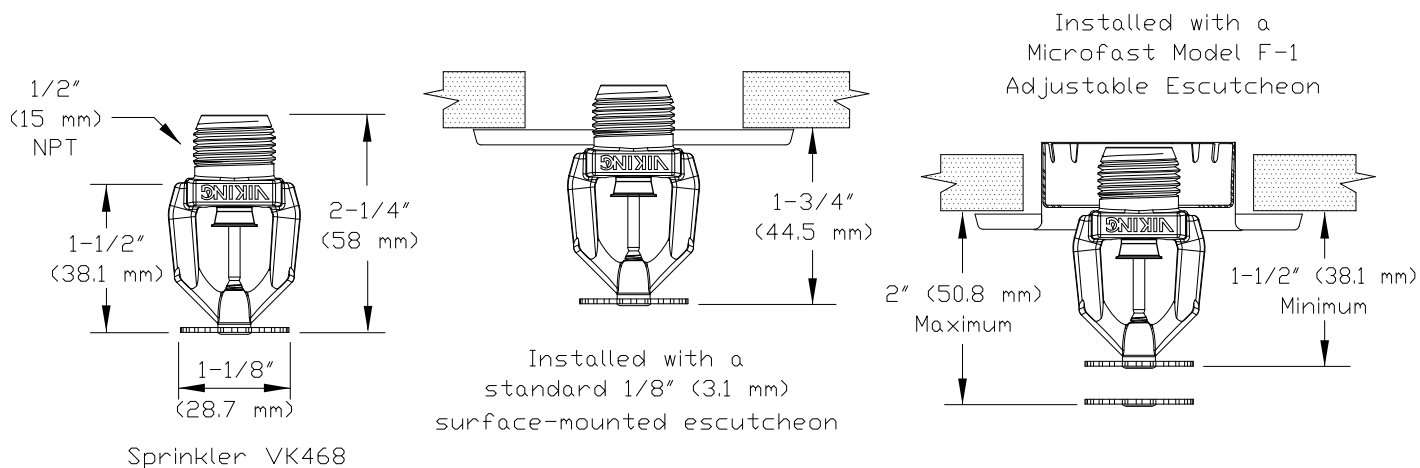


Figure 3: Sprinkler VK468 Dimensions with a Standard Escutcheon and the Model F-1 Adjustable Escutcheon



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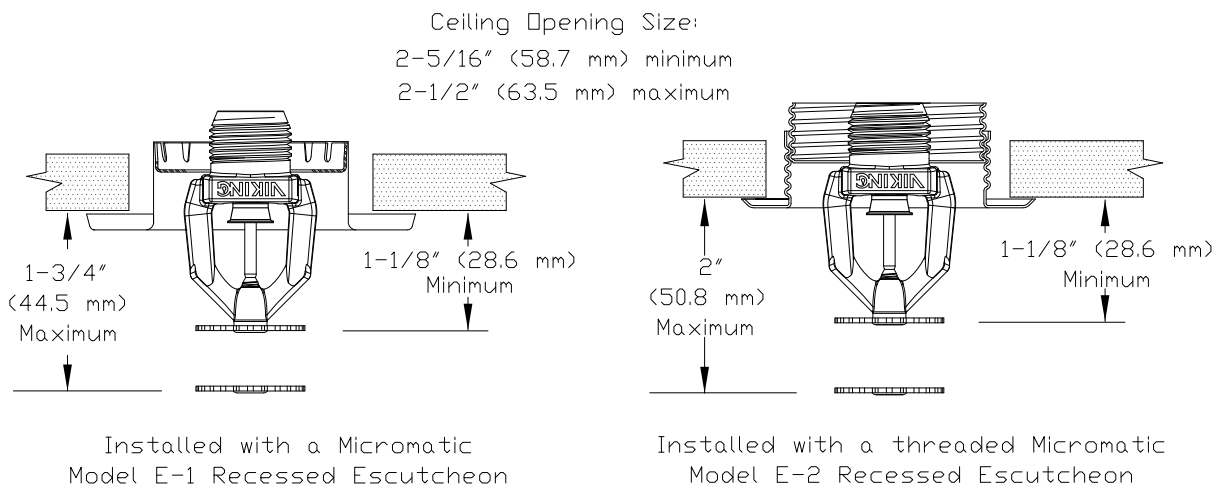


Figure 4: Sprinkler VK468 Dimensions with the Model E-1 and E-2 Recessed Escutcheons

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

QUICK RESPONSE DRY HORIZONTAL SIDEWALL SPRINKLERS

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

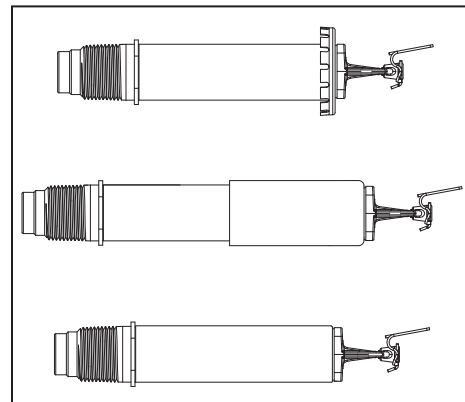
Telephone: 269-945-9501 Technical Services: 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

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

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 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.



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 1/2" 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

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 water-way. 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.

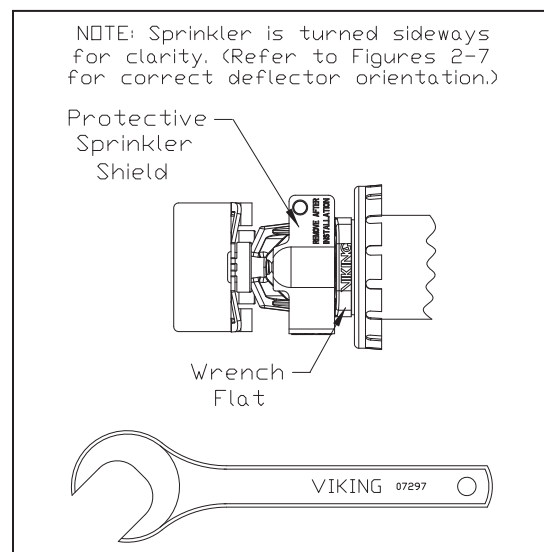


Figure 1:
Standard Sprinkler Wrench 07297W/B

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.



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

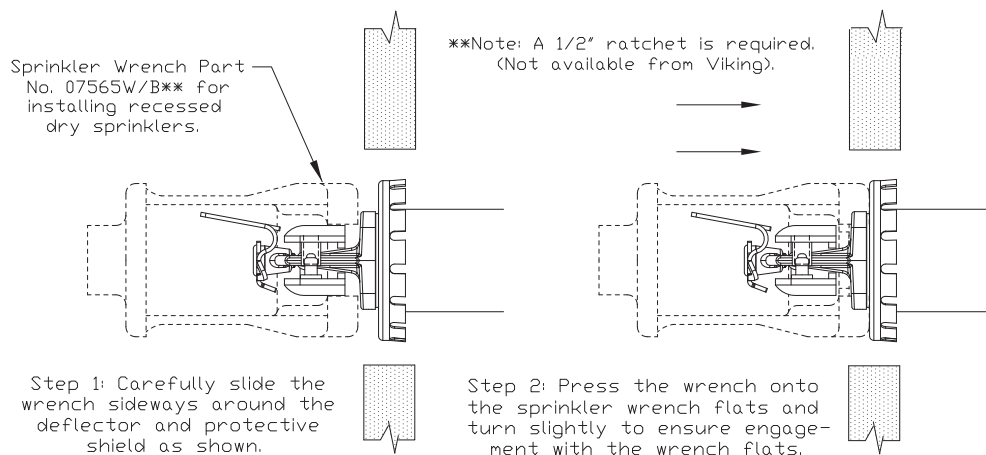


Figure 2: Wrench 07565W/B for Adjustable Recessed Dry Horizontal Sidewall Sprinklers

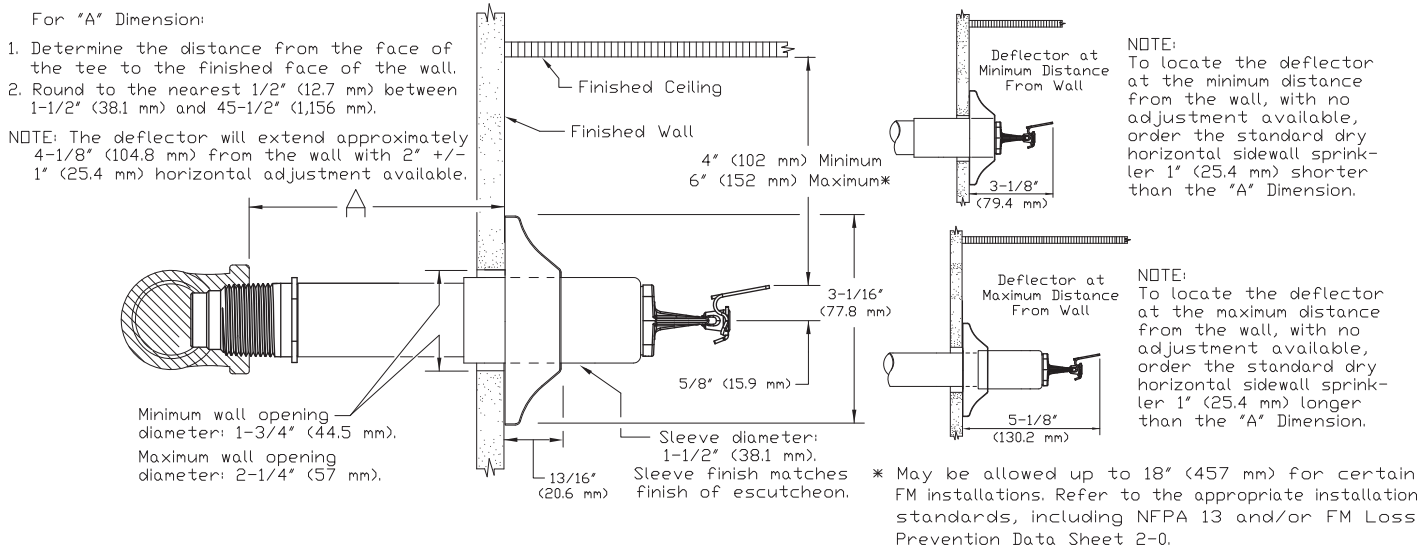


Figure 3: Adjustable Standard Dry Horizontal Sidewall Sprinkler

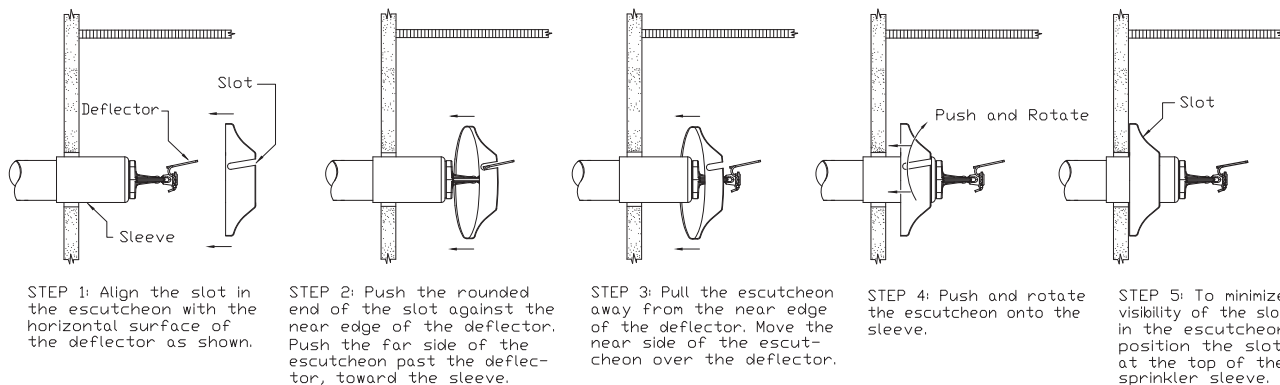


Figure 4: Adjustable Standard Escutcheon Installation



TECHNICAL DATA

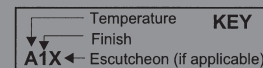
QUICK RESPONSE DRY HORIZONTAL SIDEWALL SPRINKLERS

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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 Polyester⁷ 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 Polyester⁷ with "A" dimensions 3-1/4" to 47-1/2" (82.5 mm to 1,207 mm)
- 3 - Chrome, Brass, White Polyester⁷, or ENT⁷ 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 - ENT⁷ sprinkler with an ENT⁷ Sleeve and Escutcheon with "A" dimensions 1-1/2" to 45-1/2" (38.1 mm to 1,156 mm)
- 6 - ENT⁷ 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-BI 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.



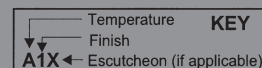
TECHNICAL DATA

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 ENT⁵ with "A" dimensions 1-1/2" to 45-1/2" (38.1 mm to 1,156 mm)

2* - Bright Brass, Chrome, White Polyester, or ENT⁵ 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 ENT⁵ "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-BI 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

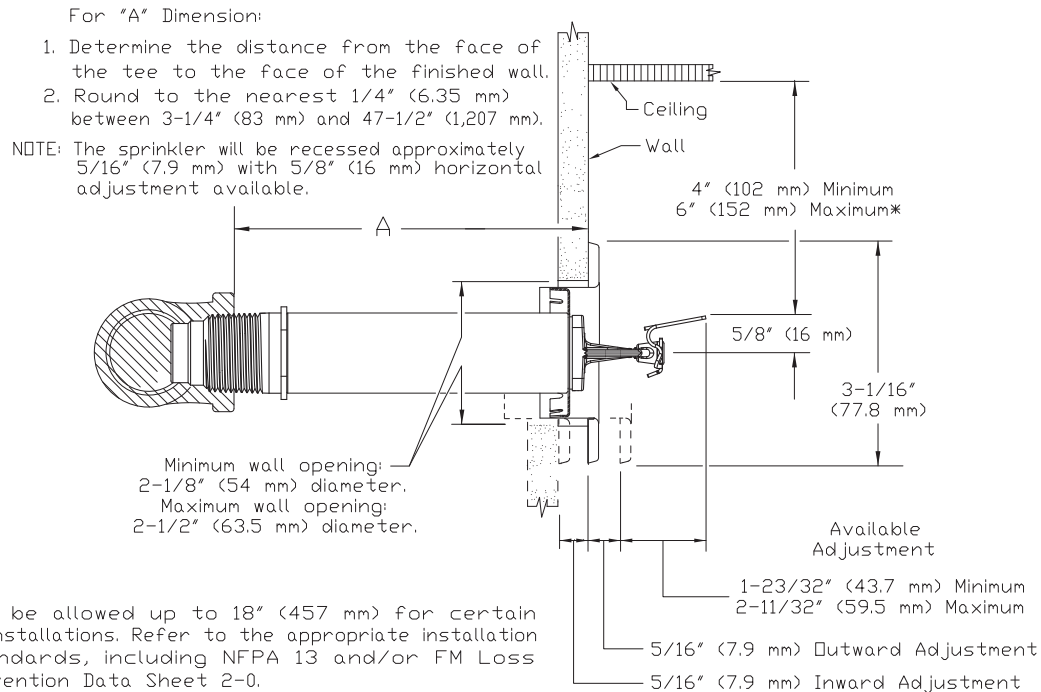


Figure 5: Adjustable Recessed Dry Horizontal Sidewall Sprinkler with the Model E-1 Escutcheon

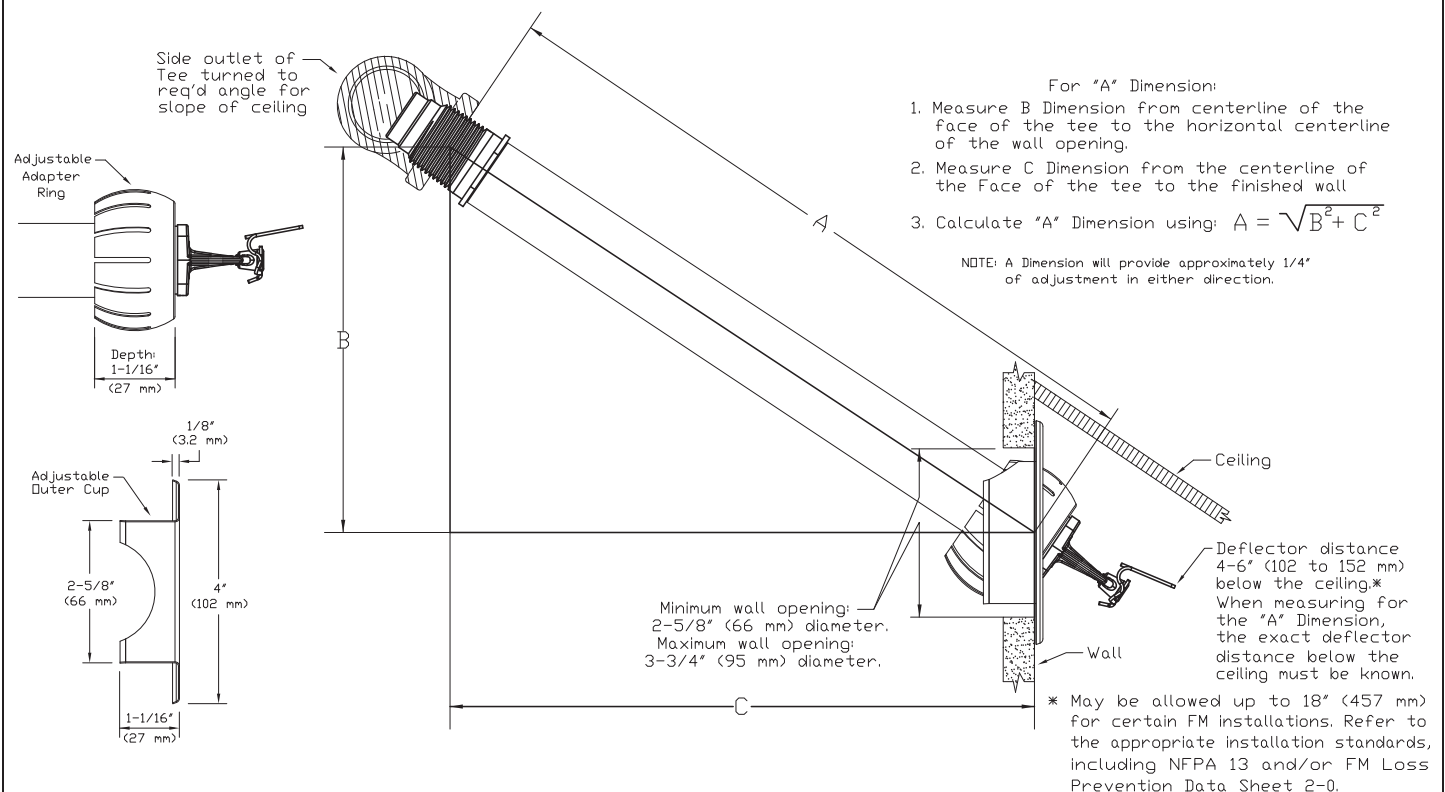


Figure 6: Adjustable Recessed Dry Horizontal Sidewall Sprinkler with the Model G-1 Escutcheon



TECHNICAL DATA

QUICK RESPONSE DRY HORIZONTAL SIDEWALL SPRINKLERS

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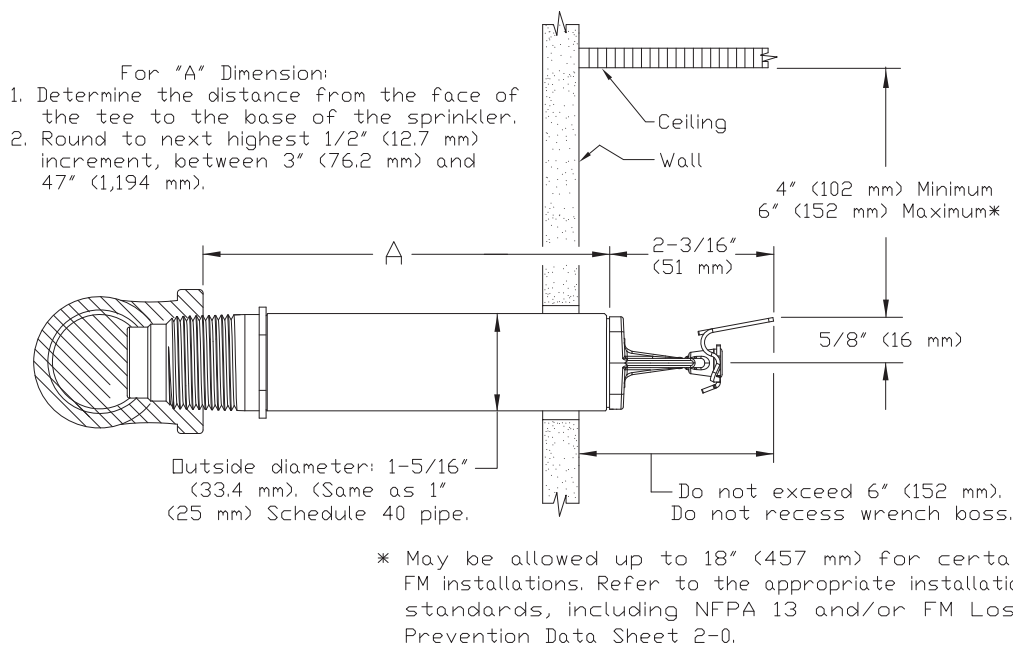


Figure 7: Quick Response Plain Barrel Dry Horizontal Sidewall Sprinkler

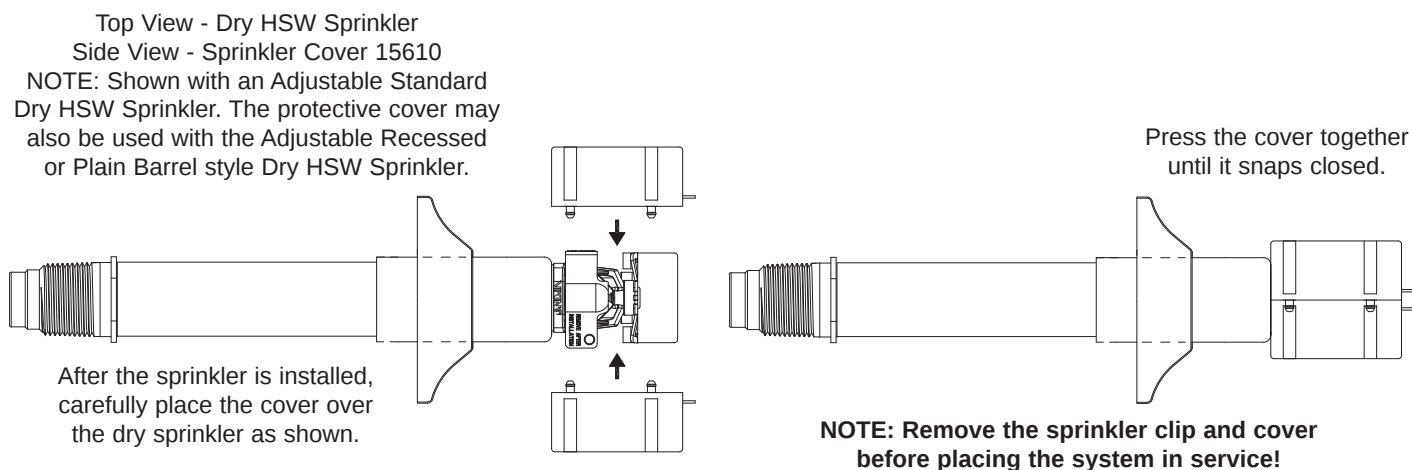


Figure 8: Dry Horizontal Sidewall Sprinkler Cover Part Number 15610 (shown with an Adjustable Standard Dry HSW Sprinkler) (Optional for temporary use with Viking Dry HSW Sprinklers until finish work is completed around the sprinkler.)



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

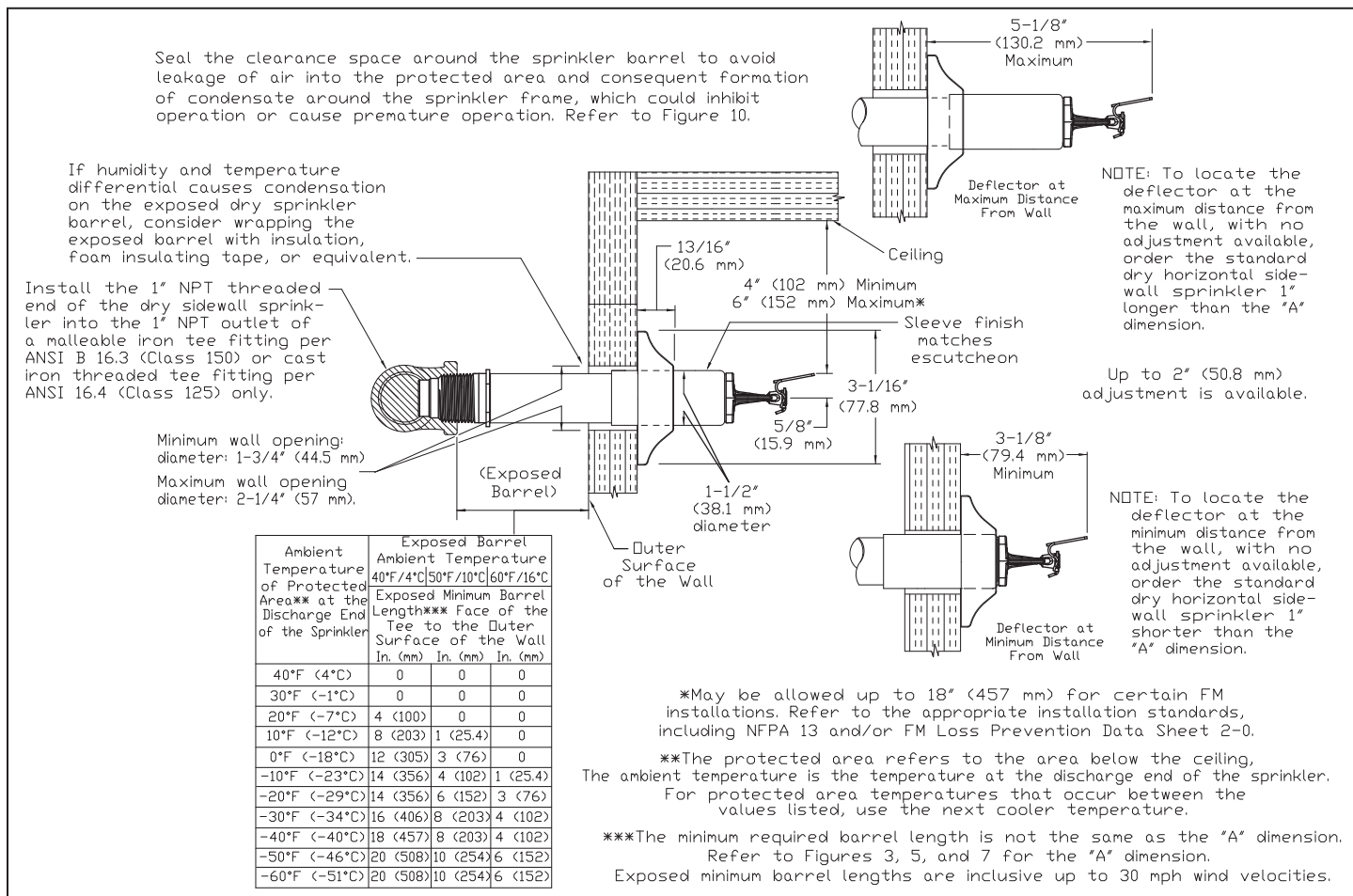


Figure 9: Dry Horizontal Sidwall Sprinkler Required Minimum Barrel Length Based on Ambient Temperature in the Protected Area (Adjustable Standard Dry HSW Sprinkler is Shown)

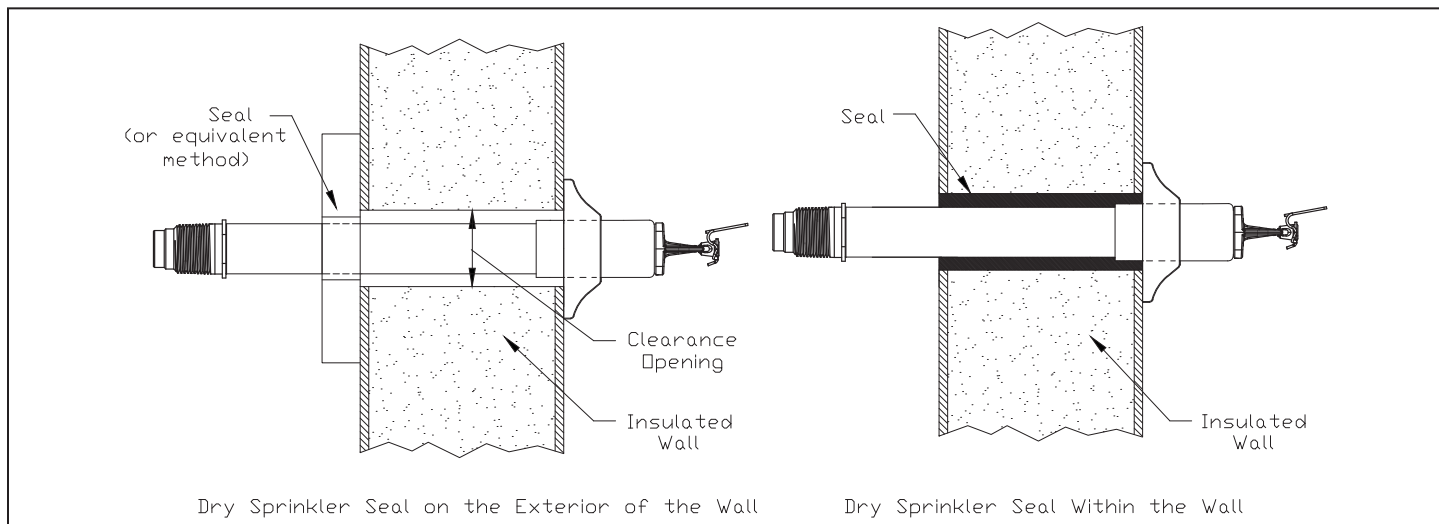


Figure 10: Dry Sprinkler Seal (Adjustable Standard Dry HSW Sprinkler is Shown)

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. Then insert the correct number and type of sprinklers in accordance with the “handbook”.

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

Specifications

Material:

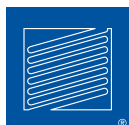
Painted Plain Steel

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



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WWW.FPPI.COM

SPECIFICATION SHEET



Series 850U

Double Check Valve Assemblies with Union End Ball Valves

Size: 1/2" - 2" (15mm - 50mm)

The FEBCO Series 850U Double Check Valve Assemblies are designed for non-health hazard applications.
End Connections – NPT ANSI/ASME B1.20.1.

Pressure – Temperature

Maximum Working Pressure: 175psi (12.1 bar)
Hydrostatic Test Press: 350psi (24.1 bar)
Temperature Range: 32°F to 140°F (0°C to 60°C)

Materials

Valve Body: Bronze
Elastomers: Silicone
Springs: Stainless Steel

Models

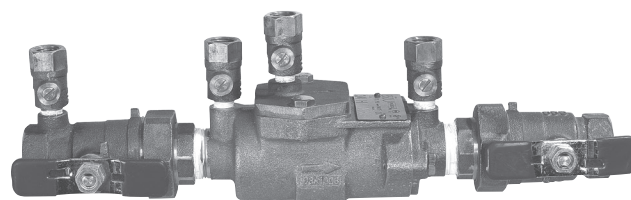
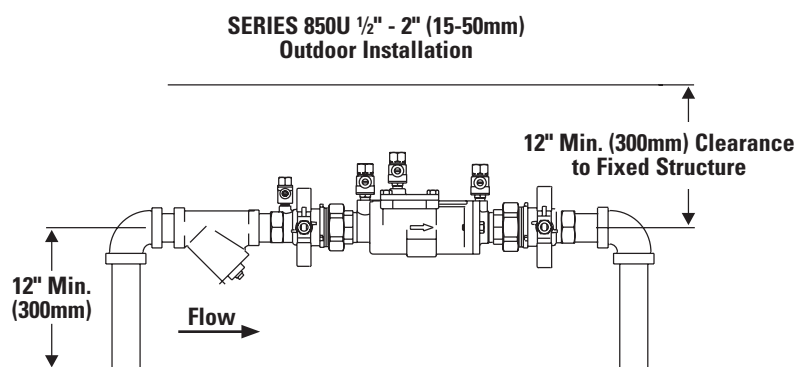
- Wye - Strainer

Approvals – Standards

- ANSI/AWWA Conformance (C510-92)
- Approved by the Foundation for Cross-Connection Control and Hydraulic Research at the University of Southern California.

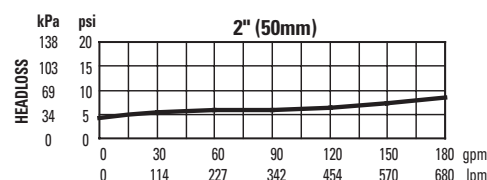
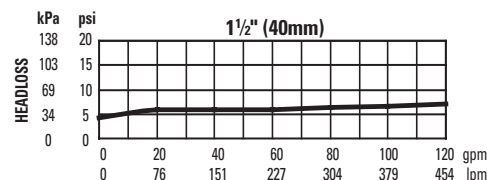
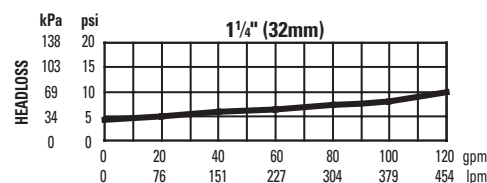
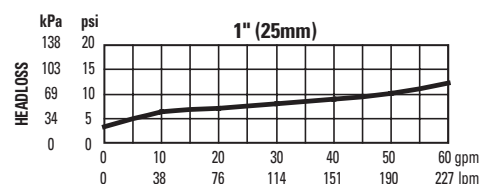
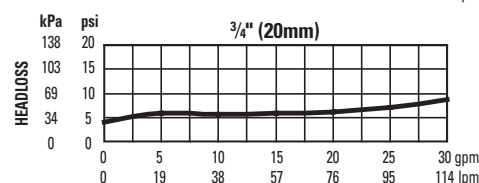
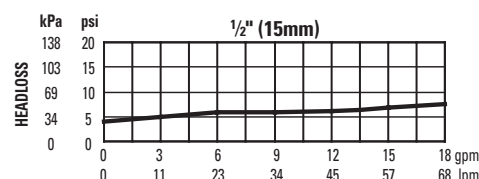


Typical Installation



Series 850U

Capacity



Job Name _____

Contractor _____

Job Location _____

Approval _____

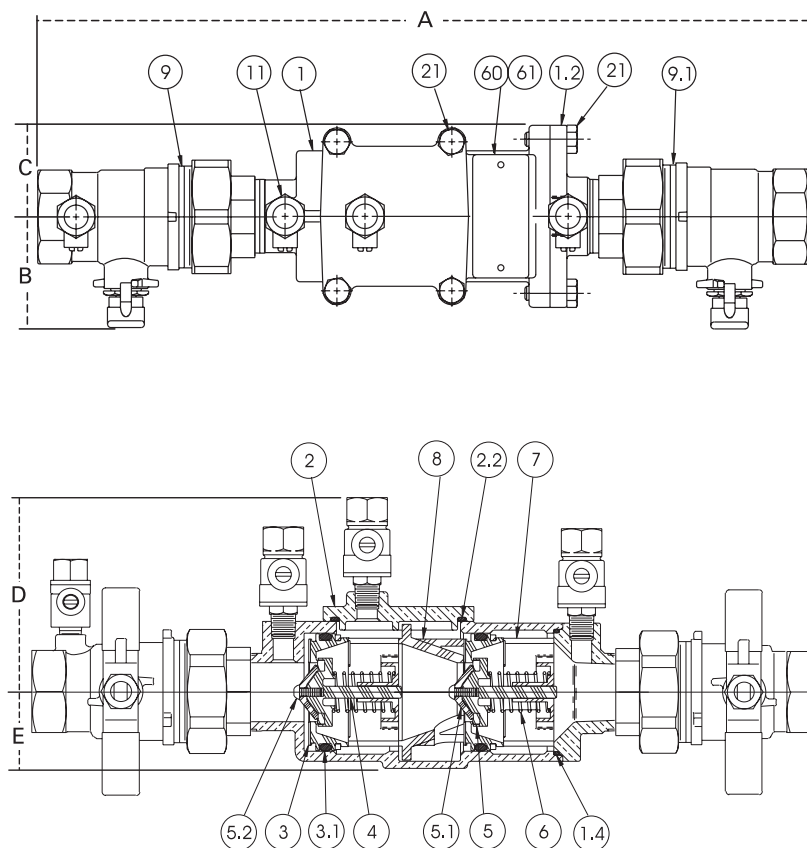
Engineer _____

Contractor's P.O. No. _____

Approval _____

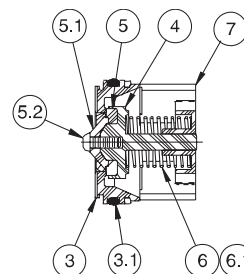
Representative _____

FEBCO product specifications in U.S. customary units and metric are approximate and are provided for reference only. For precise measurements, please contact FEBCO. FEBCO reserves the right to change or modify product design, construction, specifications, or materials without prior notice and without incurring any obligation to make such changes and modifications on FEBCO products previously or subsequently sold.



ITEM	DESCRIPTION	MATERIALS
1	Body	Bronze
1.2	Tailpiece	Bronze
1.4	O-Ring	Silicone
2	Cover	Bronze
2.2	O-Ring	Silicone
3	Seat	Noryl®
3.1	O-Ring	Silicone
4	Poppet	Noryl®
5	Seat Disc	Silicone
5.1	Disc Retainer	Noryl®
5.2	Rnd HD Screw	Stainless Steel
6	Spring	Stainless Steel
7	Guide	Noryl®
8	Retainer Spacer	Noryl®
9	Union End	Bronze
9.1	Ball Valve (w/tap)	Bronze
11	Test Cock	Bronze
21	Hex HD Capscrew	Stainless Steel
60	Identification Plate	Brass
61	Drive Screw Stick	Stainless Steel

Check Assembly



Dimensions – Weights

Size: ½" - 2" (15 - 50mm)

SIZE (DN)		DIMENSIONS										WEIGHT	
		A		B		C		D		E			
in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs.	kgs.
½	15	11	299	1½	38	1½	38	3⅞	79	1¼	32	4.2	1.9
¾	20	12½	318	1½	38	1½	38	3⅞	79	1¼	32	5.1	2.3
1	25	14⅝	372	1⅞	48	1⅝	41	3⅝	86	1½	38	7.7	3.5
1¼	32	18¼	464	3	76	2½	64	4¼	108	2¼	57	14.9	6.8
1½	40	18⅞	479	3	76	2½	64	4¼	108	2¼	57	18.0	8.2
2	50	20½	521	3½	89	2½	64	4¼	108	2¼	57	24.1	10.9

Note: Dimensions are nominal. Allowances must be made for normal manufacturing tolerances.



A Watts Water Technologies Company

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 Canada: 5435 North Service Rd. • Burlington, ONT. • L7L 5H7 • Tel. (905) 332-4090 • Fax: (905) 332-7068 • www.FEBCOonline.ca



**ISO 9001-2000
CERTIFIED**



TECHNICAL DATA

EASYPAC COMMERCIAL RISER MANIFOLD ASSEMBLIES 1-1/4" - 8" (DN32 - DN200)

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 EasyPac Commercial Riser Manifold Assemblies are available in sizes 1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 6" and 8" for commercial systems. They are available with an AGF TESTanDRAIN valve, and/or pressure relief valve (PRV) to meet NFPA 13 requirements for gridded systems and any system requiring a pressure relief valve. This configuration eliminates the need to drain the system before installing the relief valve, while a built in test port allows hydrostatic testing without draining the system.

EasyPac Commercial Assemblies are designed with all required equipment and standard components that can be replaced in the field, including pressure gauges, Potter flow switches, 3-way gauge control valve and appropriate drain valve. All assemblies are available in grooved inlet and outlet connections 1-1/4"-8" using Schedule 10 steel pipe. The 1-1/4" to 2" assemblies are also available with male NPT threaded inlets and outlets, or threaded inlets x grooved outlets using Schedule 40 steel pipe.

2. LISTINGS AND APPROVALS

Pressure Gauges: UL Listed, FM Approved

Waterflow Alarm Switch: UL Listed - Category USQT, cUL Listed, FM Approved - Waterflow Detectors, Vane Type, CSFM Listed

Ball Valve: UL Listed, FM Approved

AGF TestanDrain Model 1000: UL Listed - Category VEHZ, FM Approved - Sprinkler System Alarm Testers

AGF TestanDrain Model 1011 with Pressure Relief Valve: UL Listed - Category VEHZ, FM Approved - Sprinkler System Alarm Testers

3. TECHNICAL DATA

Specifications and Material Standards:

Available since 2007.

- Pressure Rating: 250 PSI (17.2 bar) maximum water working pressure.
- Fabricated steel pipe.
- Available in grooved inlet and outlet connections 1-1/4" to 8" using Schedule 10 steel pipe.
- 1-1/4", 1-1/2", and 2" assemblies are also available with male NPT threaded inlet and outlet, or threaded inlet x grooved outlet using Schedule 40 steel pipe.
- Riser bodies coated with black Ecoat.
- Flow Switch: Two single-pole double-throw switches with Form C contacts rated at 15 Amps 125/250 V. AC, 2.5 Amp 0-30 V. DC. Each switch can be wired for open or closed circuit operation. See Figure 1.

Ordering Information:

(Also refer to the current Viking price list.)

There are three different options are available for the commercial line:

Commercial EasyPac Assemblies with Ball Valve (See figure 2)

Commercial EasyPac Assemblies with TESTanDRAIN Valve (See figure 3)

Commercial EasyPac Assemblies with TESTanDRAIN and Pressure Relief Valve (PRV) (See figure 4)

See Table 1 for Part Numbers.

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.

4. INSTALLATION

Refer to appropriate NFPA Installation Standards.

Note: EasyPac Commercial Riser Manifold Assemblies can be installed horizontally with flow switch on top, or vertically with flow upward.

Viking EasyPac Riser Assemblies use Potter VSR flow switches. The literature that accompanies the VSR states that the switch should not be installed within 6" of a change of direction of pipe or within 24" of a valve. This is merely a recommendation to reduce the possibility of the switch not operating while minimal waterflow is occurring. This is a recommendation only, not a requirement.

5. OPERATING INSTRUCTIONS

1. To Test: Turn valve handle counterclockwise from "Off" to "Test". The handle will stop automatically. After test is completed, return handle to "Off".
2. To Drain: Turn handle counterclockwise from "Off" to "Test". The handle will stop automatically. Depress "Push" button and turn handle to "Drain". When system is empty, return handle clockwise to "Off" position.

6. INSPECTIONS, TESTS AND MAINTENANCE

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



TECHNICAL DATA

EASYPAC COMMERCIAL RISER MANIFOLD ASSEMBLIES 1-1/4" - 8" (DN32 - DN200)

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

Table 1 - Commercial EasyPac Assemblies

Pipe Size	Inlet / Outlet Connections	Option	Pipe Size	Viking Part Number
1-1/4"	Thread / Thread	Ball Valve	Schedule 40	15248
		TESTanDRAIN		14871
		TESTanDRAIN and PRV		14873
	Groove / Groove	Ball Valve	Schedule 10	15249
		TESTanDRAIN		14872
		TESTanDRAIN and PRV		14874
	Thread / Groove	Ball Valve	Schedule 40	15250
		TESTanDRAIN		15251
		TESTanDRAIN and PRV		15252
1-1/2"	Thread / Thread	Ball Valve	Schedule 40	15253
		TESTanDRAIN		14875
		TESTanDRAIN and PRV		14877
	Groove / Groove	Ball Valve	Schedule 10	15254
		TESTanDRAIN		14876
		TESTanDRAIN and PRV		14878
	Thread / Groove	Ball Valve	Schedule 40	15255
		TESTanDRAIN		15256
		TESTanDRAIN and PRV		15257
2"	Thread / Thread	Ball Valve	Schedule 40	14899
		TESTanDRAIN		14935
		TESTanDRAIN and PRV		14847
	Groove / Groove	Ball Valve	Schedule 10	14848
		TESTanDRAIN		14850
		TESTanDRAIN and PRV		14851
	Thread / Groove	Ball Valve	Schedule 40	15258
		TESTanDRAIN		15259
		TESTanDRAIN and PRV		15260
2-1/2"	Groove / Groove	Ball Valve	Schedule 10	14852
		TESTanDRAIN		14853
		TESTanDRAIN and PRV		14854
3"	Groove / Groove	Ball Valve	Schedule 10	14855
		TESTanDRAIN		14856
		TESTanDRAIN and PRV		14857
4"	Groove / Groove	Ball Valve	Schedule 10	14858
		TESTanDRAIN		14859
		TESTanDRAIN and PRV		14860
6"	Groove / Groove	Ball Valve	Schedule 10	14861
		TESTanDRAIN		14862
		TESTanDRAIN and PRV		14863
8"	Groove / Groove	Ball Valve	Schedule 10	15264
		TESTanDRAIN		15265
		TESTanDRAIN and PRV		15266

TESTanDRAIN Option:

Includes a test orifice with size specified from 3/8" (K2.8) to 25K ESFR*, depending on the smallest sprinkler installed on the system. Must add suffix to the part number for the desired orifice size.

Orifice Suffix:

A = 3/8" (K 2.8)
B = 7/16" (K 4.2)
C = 1/2" (K 5.6)
D = 17/32" (K 8.0)
E = K 11.2 ELO
F = K14 ESFR
G = K25 ESFR

TESTanDRAIN with PRV Option:

Includes test orifice and pressure relief valve. The test orifice must be specified based on the smallest sprinkler installed on the system for 3/8" (K2.8) to K25 ESFR*. The pressure relief valve is not factory assembled to the TestanDrain. Must add suffix to the part number for the desired orifice size and pressure setting of the pressure relief valve.

Orifice Suffix:

A = 3/8" (K 2.8)
B = 7/16" (K 4.2)
C = 1/2" (K 5.6)
D = 17/32" (K 8.0)
E = K 11.2 ELO
F = K14 ESFR
G = K25 ESFR

PRV Suffix:

175
185
195
205
225
250

NOTE: It is important to note that the pressure rating of the relief valve indicates an operating range of pressure for both opening and closing of the valve. Standard relief valves are required to OPEN in a range of pressure between 90% and 105% of their rating. The valves are required to CLOSE at a pressure above 80% of that rating.

* ESFR TESTanDRAIN not available in 1-1/4", 1-1/2" or 2" Risers.

Table 2 - Pipe Diameters

	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	6"	8"
Pipe OD	1.660" (42 mm)	1.900" (48 mm)	2.375" (60 mm)	2.875" (73 mm)	3.5" (89 mm)	4.5" (114 mm)	6.625" (168 mm)	8.625" (219 mm)
Schedule 10 Pipe ID	1.45" (36.6 mm)	1.69" (42.7 mm)	2.16" (54.8 mm)	2.64" (66.9 mm)	3.26" (82.8 mm)	4.26" (108.2 mm)	6.36" (161.5 mm)	8.249" (209.5 mm)
Schedule 40 Pipe ID	1.38" (35.1 mm)	1.61" (40.9 mm)	2.07" (52.5 mm)	N/A	N/A	N/A	N/A	N/A



TECHNICAL DATA

EASYPAC COMMERCIAL RISER MANIFOLD ASSEMBLIES 1-1/4" - 8" (DN32 - DN200)

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

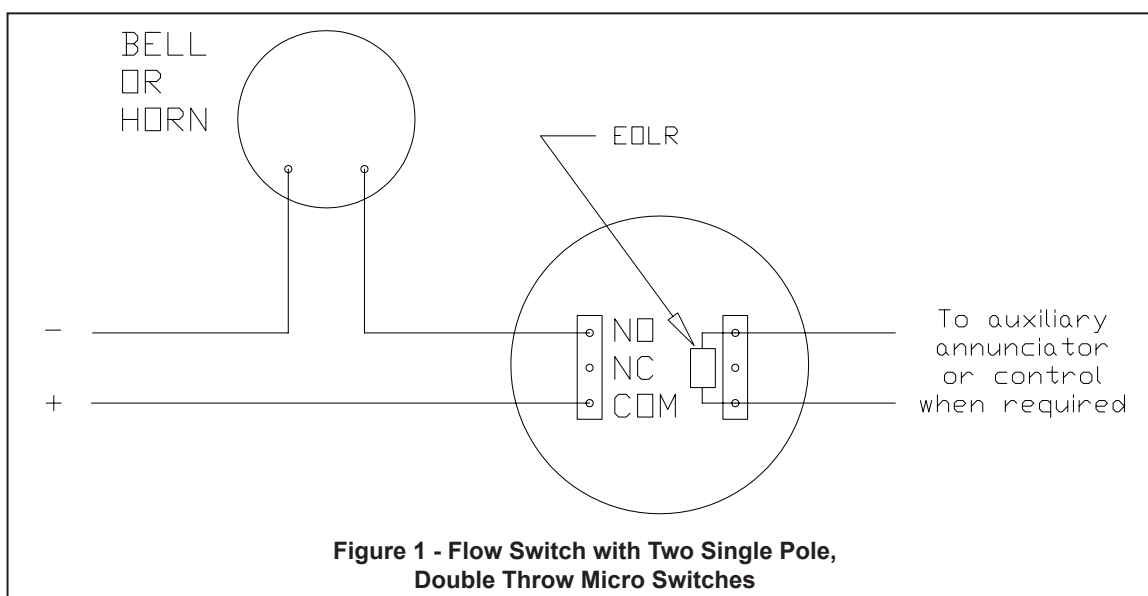
Telephone: 269-945-9501 Technical Services 877-384-5464 Fax: 269-818-1680 Email: techsvcs@vikingcorp.com

7. AVAILABILITY

The Viking EasyPac Riser Assemblies are 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.





TECHNICAL DATA

EASYPAC COMMERCIAL RISER MANIFOLD ASSEMBLIES 1-1/4" - 8" (DN32 - DN200)

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

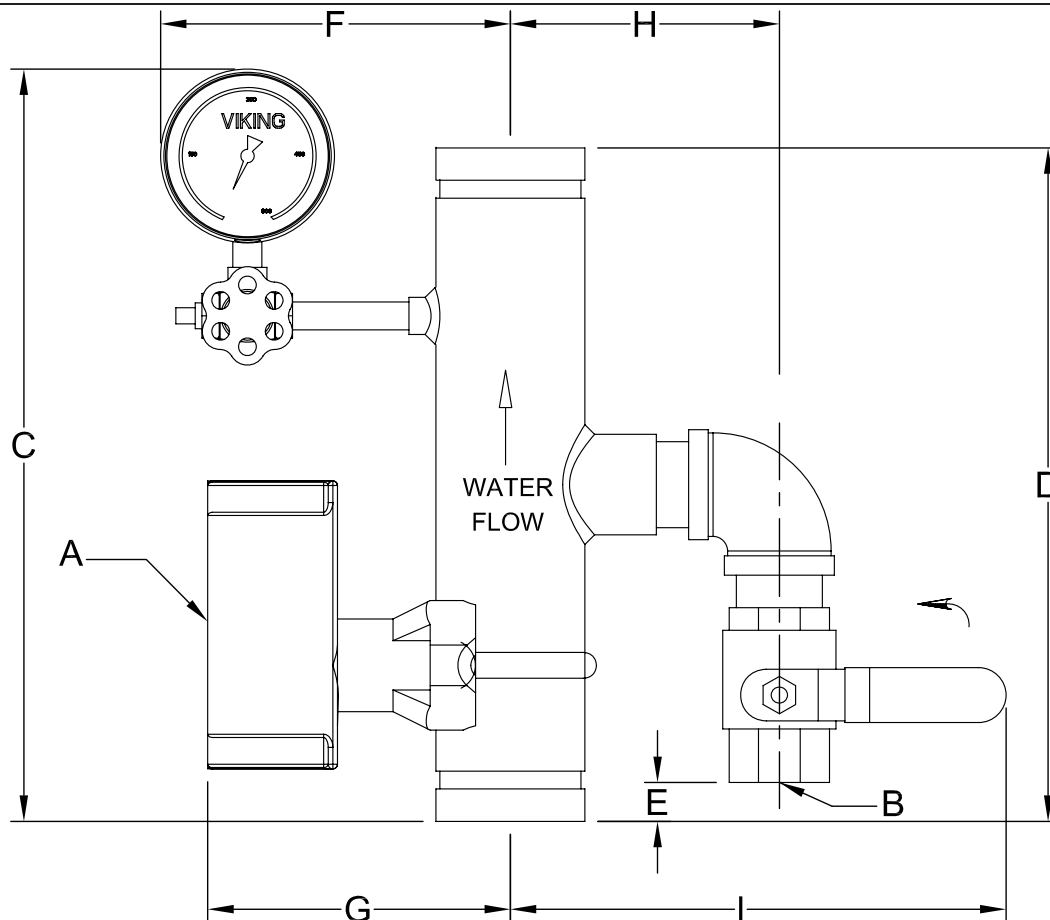


Figure 2 - Basic Commercial EasyPac

Size	A	B	C	D	E	F	G	H	I
1-1/4" (DN32)	VSR-S Flow Switch	1" NPT	16-1/2" (419)	15" (381)	1-1/2" (38)	6-3/32" (155)	6-11/32" (161)	4-3/16" (107)	8-9/16" (218)
1-1/2" (DN40)	VSR-S Flow Switch	1" NPT	16-1/2" (419)	15" (381)	1-1/2" (38)	7-19/32" (193)	6-15/16" (164)	5-11/16" (144)	10-1/16" (256)
2" (DN50)	VSR Flow Switch	1" NPT	14-1/2" (369)	13" (330)	-15/32" (12)*	6-7/16" (164)	5-51/64" (148")	4-9/16" (116)	8-59/64" (227)
2-1/2" (DN65)	VSR Flow Switch	1-1/4" NPT	14-1/2" (369)	13" (330)	5/8" (16)	6-11/16" (170)	6-3/64" (154)	5-1/4" (133)	9-39/64" (244)
3" (DN80)	VSR Flow Switch	1-1/4" NPT	14-1/2" (369)	13" (330)	5/8" (16)	7" (178)	6-23/64" (162)	5-9/16" (141)	9-59/64" (252)
4" (DN100)	VSR Flow Switch	2" NPT	14-1/2" (369)	13" (330)	-1-3/4" (-44)*	7-1/2" (191)	6-25/32" (173)	7-3/4" (197)	13-5/16" (338)
6" (DN150)	VSR Flow Switch	2" NPT	14-1/2" (369)	13" (330)	-1-3/4" (-44)*	8-35/64" (217)	7-53/64" (199)	8-51/64" (223)	14-23/64" (365)
8" (DN200)	VSR Flow Switch	2" NPT	14-3/4" (375)	13" (330)	-1-3/4" (-44)*	9-1/2" (243)	8-3/4" (225)	9-3/4" (249)	15-1/2" (391)

* Dimension E is negative because the ball valve extends below the end of the manifold body.



TECHNICAL DATA

EASYPAC COMMERCIAL RISER MANIFOLD ASSEMBLIES 1-1/4" - 8" (DN32 - DN200)

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

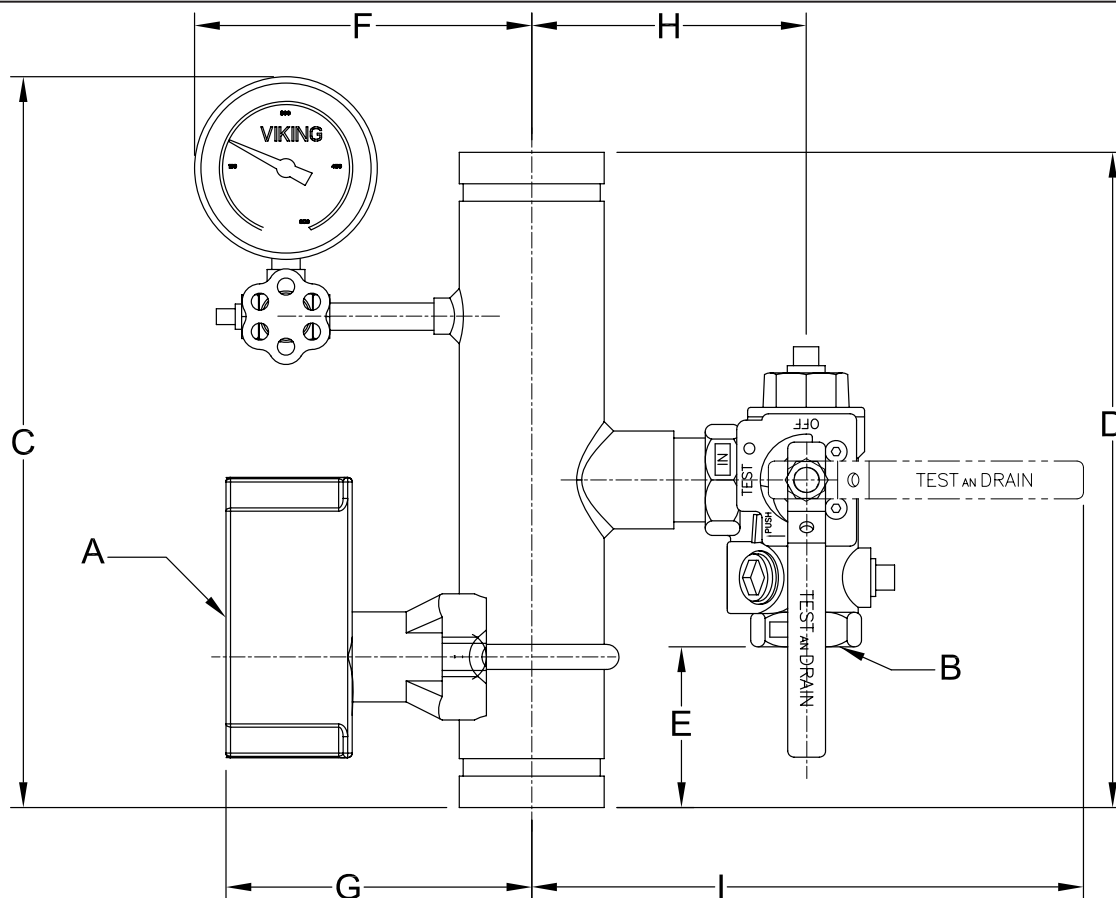


Figure 3 - Commercial EasyPac with TESTanDRAIN

Size	A	B	C	D	E	F	G	H	I
1-1/4" (DN32)	VSR-S Flow Switch	1" NPT	16-1/2" (419)	15" (381)	5-1/8" (131)	6-3/32" (155)	6-11/32" (161)	4-1/2" (114)	9-3/32" (231)
1-1/2" (DN40)	VSR-S Flow Switch	1" NPT	16-1/2" (419)	15" (381)	5-1/8" (131)	7-19/32" (193)	6-15/16" (164)	4-3/4" (121)	9-7/32" (234)
2" (DN50)	VSR Flow Switch	1" NPT	14-1/2" (369)	13" (330)	3-1/16" (78)	6-7/16" (164)	5-51/64" (148")	4-49/64" (121)	9-35/64" (242)
2-1/2" (DN65)	VSR Flow Switch	1-1/4" NPT	14-1/2" (369)	13" (330)	3-1/4" (83)	6-11/16" (170)	6-3/64" (154)	6-1/4" (159)	10-61/64" (278)
3" (DN80)	VSR Flow Switch	1-1/4" NPT	14-1/2" (369)	13" (330)	3-1/4" (83)	7" (178)	6-23/64" (162)	5-5/8" (143)	11-17/64" (286)
4" (DN100)	VSR Flow Switch	2" NPT	14-1/2" (369)	13" (330)	2-5/8" (66)	7-1/2" (191)	6-25/32" (173)	8-3/16" (208)	16-3/8" (416)
6" (DN150)	VSR Flow Switch	2" NPT	14-1/2" (369)	13" (330)	2-5/8" (66)	8-35/64" (217)	7-53/64" (199)	9-15/64" (235)	17-27/64" (443)
8" (DN200)	VSR Flow Switch	2" NPT	14-3/4" (375)	13" (330)	2-3/4" (70)	9-1/2" (243)	8-3/4" (225)	10-1/4" (262)	18-1/2" (468)



TECHNICAL DATA

EASYPAC COMMERCIAL RISER MANIFOLD ASSEMBLIES

1-1/4" - 8" (DN32 - DN200)

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

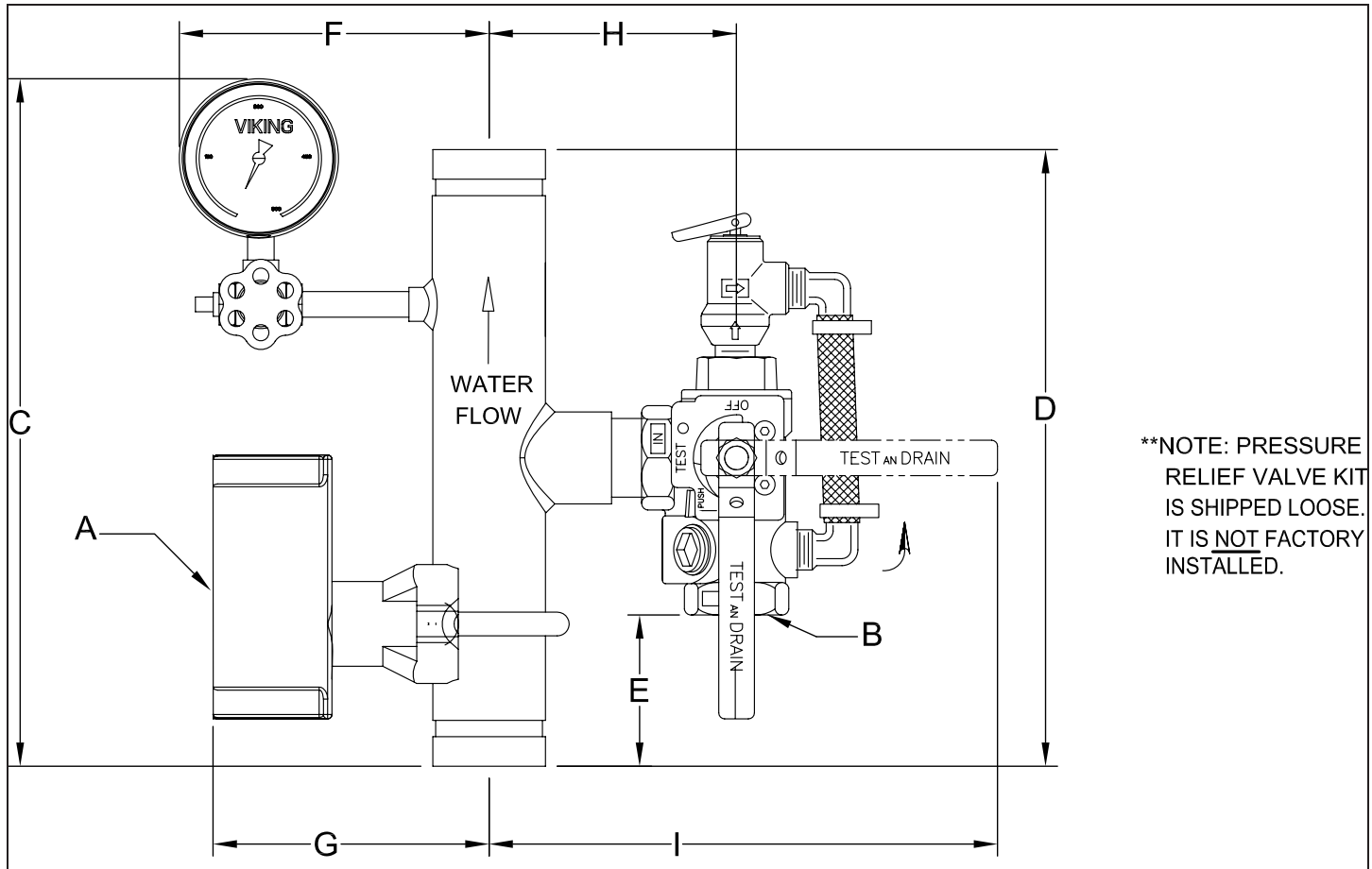


Figure 4 - Commercial EasyPac with TESTanDRAIN and PRV

Size	A	B	C	D	E	F	G	H	I
1-1/4" (DN32)	VSR-S Flow Switch	1" NPT	16-1/2" (419)	15" (381)	5-1/8" (131)	6-3/32" (155)	6-11/32" (161)	4-1/2" (114)	9-3/32" (231)
1-1/2" (DN40)	VSR-S Flow Switch	1" NPT	16-1/2" (419)	15" (381)	5-1/8" (131)	7-19/32" (193)	6-15/16" (164)	4-3/4" (121)	9-7/32" (234)
2" (DN50)	VSR Flow Switch	1" NPT	14-1/2" (369)	13" (330)	3-3/16" (81)	6-7/16" (164)	5-51/64" (148")	5-13/64" (132)	10-45/64" (272)
2-1/2" (DN65)	VSR Flow Switch	1-1/4" NPT	14-1/2" (369)	13" (330)	3-1/4" (83)	6-11/16" (170)	6-3/64" (154)	6-1/4" (159)	10-61/64" (278)
3" (DN80)	VSR Flow Switch	1-1/4" NPT	14-1/2" (369)	13" (330)	3-1/4" (83)	7" (178)	6-23/64" (162)	5-5/8" (143)	11-17/64" (286)
4" (DN100)	VSR Flow Switch	2" NPT	14-1/2" (369)	13" (330)	2-5/8" (66)	7-1/2" (191)	6-25/32" (173)	8-3/16" (208)	16-3/8" (416)
6" (DN150)	VSR Flow Switch	2" NPT	14-1/2" (369)	13" (330)	2-5/8" (66)	8-35/64" (217)	7-53/64" (199)	9-15/64" (235)	17-27/64" (443)
8" (DN200)	VSR Flow Switch	2" NPT	14-3/4" (375)	13" (330)	2-3/4" (70)	9-1/2" (243)	8-3/4" (225)	10-1/4" (262)	18-1/2" (468)



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**



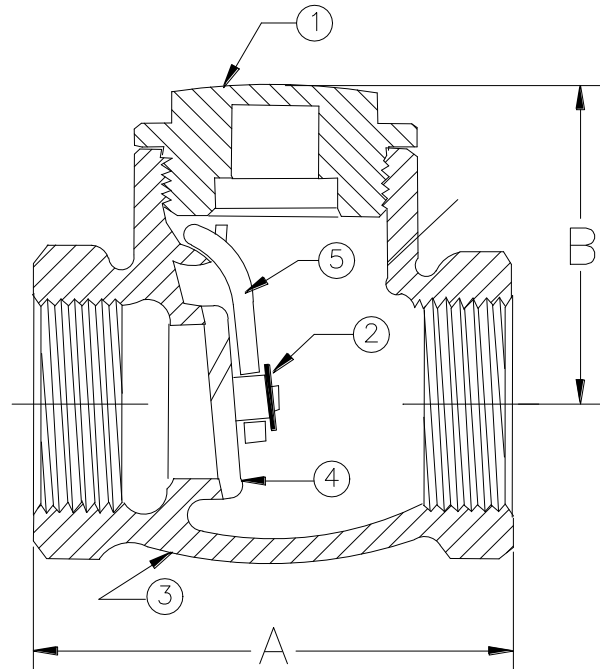
Swing Check Valve with 1/8" orifice in clapper.

***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 (1/4" – 1") Cap (1 1/4" – 2")	Bronze Brass
2	Washer	Brass
3	Body	Bronze
4	Disc	Brass
5	Hinge	Stainless Steel



Size	1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	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 Wilka 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





Stock No. 1144440

WARNING

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

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

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

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

One or two family dwelling

Residential occupancy up to four stories

National Fire Alarm Code

NFPA-13

NFPA-13D

NFPA-13R

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), 1 1/4" (32mm), 1 1/2" (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.

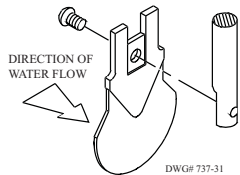
The device can also be used in copper or plastic pipe installations with the proper adapters so that the specified TEE fitting may be installed on the pipe run.

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

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.

DO NOT LEAVE COVER OFF FOR EXTENDED PERIOD OF TIME
COVER TAMPER SWITCH

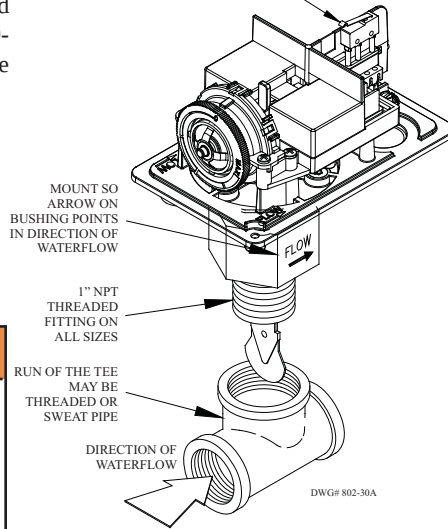
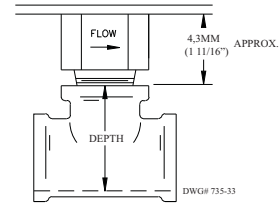


Fig. 2



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.

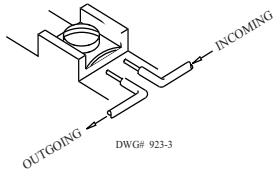
Important - The depth to the inside bottom of the tee should have the following dimensions:

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.

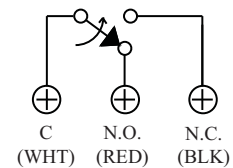
Fig. 3 Switch Terminal Connections Clamping Plate Terminal



WARNING

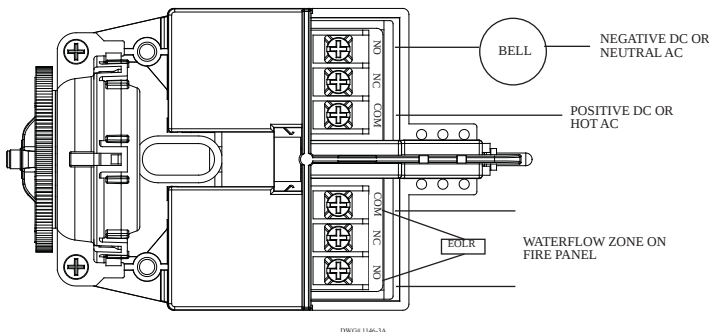
An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render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

Fig. 7 Cover Tamper Switch Wiring
(Shown with cover in place)



DWG# 8810018-2

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.

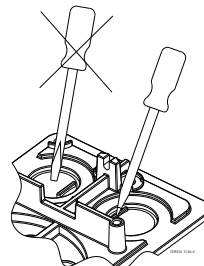
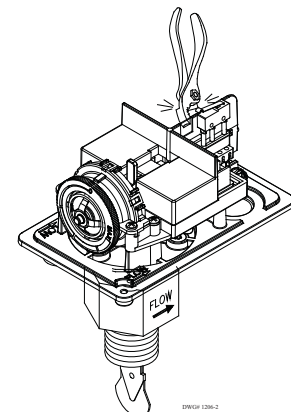


Fig. 6

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.

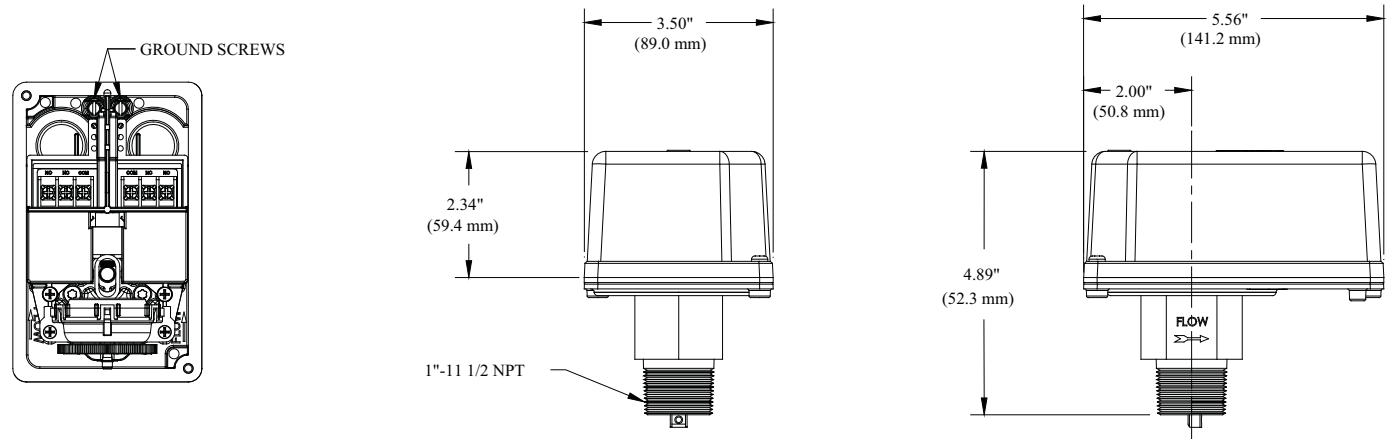
Removal

- 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



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.

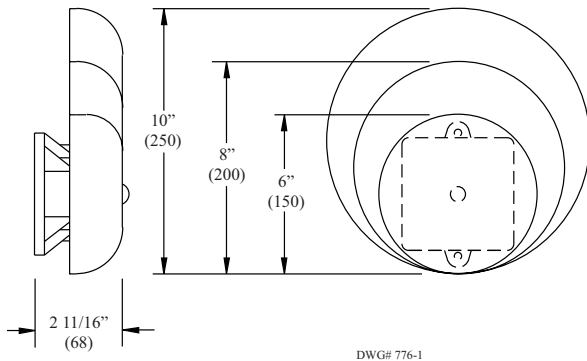
* Does not have ULC listing.

⚠ 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.

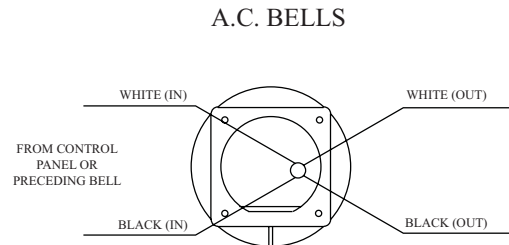
Bells Dimensions Inches (mm)

Fig. 1



Wiring (rear view)

Fig. 3



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

NOTES:

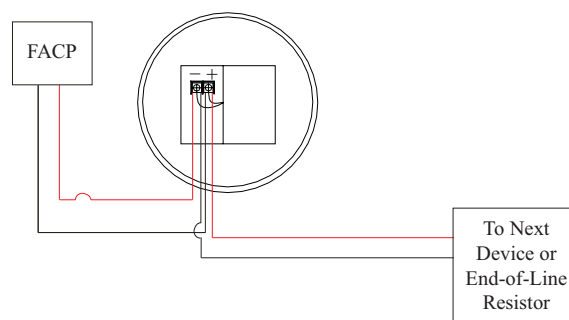
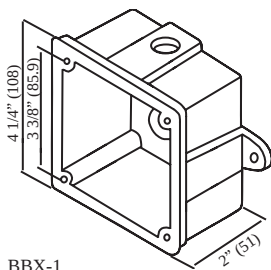
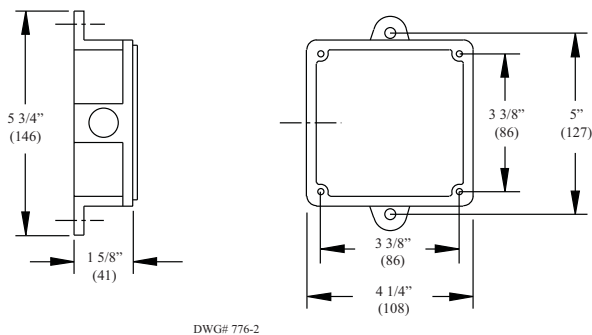
1. WHEN USING AC BELLS, TERMINATE EACH EXTRA WIRE SEPARATELY AFTER LAST BELL.
2. END-OF-LINE RESISTOR IS NOT REQUIRED ON AC BELLS.

DWG# 776-3

Weatherproof Backbox Dimensions Inches (mm)

Fig. 2

Box has one threaded 1/2" conduit entrance



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.

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.



BULL MOOSE TUBE COMPANY

A CAPARO company

1819 Clarkson Road
Chesterfield, MO 63017
(800) 325-4467
FAX: (636) 537-2645

www.bullmoosetube.com

e-mail: sales@bullmoosetube.com

For additional information,
contact your salesperson
today at (800) 325-4467 or
(636) 537-2600 in the USA,
or from Canada
call (800) 882-4666





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/M ³)	ACGIH TLV (mg/M ³)
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 soluble in water.

SECTION 3 - Fire & Explosion Data

FLASH POINT: Not Applicable

EXTINGUISHING MEDIA: Water spray or ABC dry chemical

AUTO-IGNITION TEMPERATURE: Not Applicable

NATIONAL FIRE PROTECTION ASSOCIATION DATA:

FLAMMABLE LIMITS: LEL N/A UEL N/A

Health - 1
Reactivity - 1

Flammability - 0
Special - None

SPECIAL FIRE FIGHTING PROCEDURES: None when solid.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Do not use water on molten metal.





MSDS No. 001 Leaded Red Brass Pipe Fittings

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 temperature.

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 emissions 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 discoloration and corrosion.

OTHER PRECAUTIONS: Never place wet brass parts into a melting furnace - explosion hazard.

This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief accurate and reliable as of the date compiled. However, no representation, warrantee or guarentee is made to its accuracy, reliability, or completeness. It is the user's responsibility to satisfy themselves as to the suitability or completeness of such information for their own particular use. We do not accept liability for any loss or damage that may occur from the use of this product either singly or in combination with other substances. This MSDS is equivalent to OSHA Form 20.

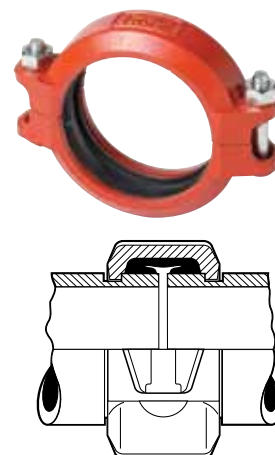
Flexible Coupling

STYLE 75



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 _____

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REV_M



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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 – 3/8 x 2	2.38 61	4.27 108	1.77 45	1.3 0.6
1 1/4 32	1.660 42.2	500 3450	1080 4805	0 – 0.06 0 – 1.6	2° – 10'	0.45 38	2 – 3/8 x 2	2.68 68	4.61 117	1.77 45	1.4 0.6
1 1/2 40	1.900 48.3	500 3450	1420 6320	0 – 0.06 0 – 1.6	1° – 56'	0.40 33	2 – 3/8 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 – 3/8 x 2	3.43 87	5.22 133	1.88 48	1.7 0.8
2 1/2 65	2.875 73.0	500 3450	3245 14440	0 – 0.06 0 – 1.6	1° – 15'	0.26 22	2 – 3/8 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 – 3/8 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 – 1/2 x 2 3/4	4.50 114	7.00 178	1.88 48	2.9 1.3
3 1/2 90	4.000 101.6	500 3450	6300 28035	0 – 0.06 0 – 1.6	0° – 54'	0.19 16	2 – 1/2 x 2 3/4	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 – 1/2 x 2 3/4	5.80 147	8.03 204	2.13 54	4.1 1.9
108.0mm	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 1/2 120	5.000 127.0	450 3100	8820 39250	0 – 0.13 0 – 3.2	1° – 26'	0.25 21	2 – 5/8 x 3 1/4	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 – 5/8 x 3 1/4	6.88 175	10.07 256	2.13 54	5.8 2.6
133.0mm	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
139.7mm	5.500 139.7	450 3100	10665 47460	0 – 0.13 0 – 3.2	1° – 18'	0.28 24	2 – 5/8 x 3 1/4	6.80 173	9.59 244	2.13 54	6.3 2.9
152.4mm	6.000 152.4	450 3100	12735 56670	0 – 0.13 0 – 3.2	1° – 12'	0.21 18	2 – 5/8 x 3 1/4	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 – 5/8 x 3 1/4	8.00 203	11.07 281	2.13 54	7.0 3.2
159.0mm	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 – 3/4 x 4 1/4	10.34 263	13.97 355	2.32 59	12.4 5.6

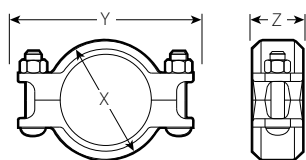
* Working Pressure and End Load are total, from all internal and external loads, based on standard weight (ANSI) steel pipe, standard roll or cut grooved in accordance with Victaulic specifications. Contact Victaulic for performance on other pipe.

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 3/4 – 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.

For complete contact information, visit www.victaulic.com

06.05 1470 REV M UPDATED 2/2011

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06.05



FireLock® Fittings



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 _____

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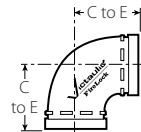
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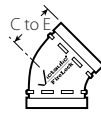
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FireLock® Fittings

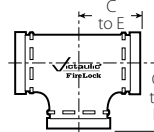
DIMENSIONS



NO. 001



NO. 003



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 †			
Nominal Size Inches mm	Actual Outside Diameter Inches mm	Elbows		No. 002 Straight Tee	
		No. 001 90° Elbow	No. 003 45° Elbow	Branch	Run
1 ¼	1.660	—	—	—	—
32	42.4	—	—	—	—
1 ½	1.900	—	—	—	—
40	48.3	—	—	—	—
2	2.375	3.5	1.8	8.5	3.5
50	60.3	1.1	0.5	2.6	1.1
2 ½	2.875	4.3	2.2	10.8	4.3
65	73.0	1.3	0.7	3.3	1.3
76.1 mm	3.000	4.5	2.3	11.0	4.5
	76.1	1.4	0.7	3.4	1.4
3	3.500	5.0	2.6	13.0	5.0
80	88.9	1.5	0.8	4.0	1.5
108 mm	4.250	6.4	3.2	15.3	6.4
	108.0	2.0	0.9	4.7	2.0
4	4.500	6.8	3.4	16.0	6.8
100	114.3	2.1	1.0	4.9	2.1
5	5.563	8.5	4.2	21.0	8.5
125	141.3	2.6	1.3	6.4	2.6
159 mm	6.250	9.4	4.9	25.0	9.6
	158.8	2.9	1.5	7.6	2.9
6	6.625	10.0	5.0	25.0	10.0
150	168.3	3.0	1.5	7.6	3.0
8	8.625	13.0	5.0	33.0	13.0
200	219.1	4.0	1.5	10.1	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.

For complete contact information, visit www.victaulic.com

10.03 1539 REV K UPDATED 09/2012

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45° ELBOW**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.

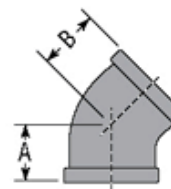


For Listing/Approval Details and Limitations visit our Web Site www.anvilintl.com or contact an Anvil®/AnvilStar™ Sales Representative.

45° ELBOW						
Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions		Approx. Wt. Each
In. (mm)			PSI (kPa)	A In. (mm)	B In. (mm)	Lbs. (kg)
1 25	840002133	DB45033	500 3450	1.12 28.44	1.12 28.44	0.46 0.21
1½ 32	840002141	DB45044	500 3450	1.29 32.76	1.29 32.76	0.73 0.33
1¾ 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.



SPF Cast & Ductile Iron Fittings

www.anvilstar.com



90° ELBOW**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.

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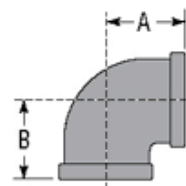
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90° ELBOW						
Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions		Approx. Wt. Each
In. (mm)			PSI (kPa)	A In. (mm)	B In. (mm)	Lbs. (kg)
1 20	840000004	0890033	500 3450	1.50 38.10	1.50 38.10	0.62 0.28
1 1/4 32	840000012	0890044	500 3450	1.75 44.45	1.75 44.45	0.90 0.41
1 1/2 40	840000020	0890055	500 3450	1.94 49.276	1.94 49.276	1.20 0.54
2 50	840000038	0890066	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.



SPF Cast & Ductile Iron Fittings

www.anvilstar.com

BULL HEAD TEE



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.

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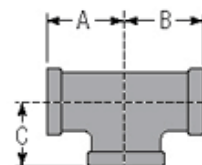
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BULL HEAD TEE							
Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions			Approx. Wt. Each
in. (mm)			PSI (kPa)	A in. (mm)	B in. (mm)	C in. (mm)	Lbs. (kg)
1 x 1 1/4 25 x 25 x 32	840004238	D1334	500 3450	1.67 42.41	1.67 42.41	1.58 40.73	0.98 0.44
1 x 1 1/2 25 x 25 x 40	840004246	D1335	500 3450	1.80 45.72	1.80 45.72	1.65 41.91	1.16 0.53
1 1/4 x 1 1/4 32 x 25 x 40	840004295	D1435	500 3450	1.88 47.75	1.80 45.72	1.82 46.22	1.42 0.64
1 1/4 x 1 1/2 x 1 1/2 32 x 32 x 40	840004337	D1445	500 3450	1.88 47.75	1.88 47.75	1.82 46.22	1.45 0.66
1 1/4 x 1 1/2 x 2 32 x 32 x 50	840004345	D1446	500 3450	2.10 53.34	2.10 53.34	1.90 48.26	1.75 0.79
1 1/2 x 1 1/2 x 2 40 x 32 x 50	840004436	D1546	500 3450	2.16 54.86	2.10 53.34	2.02 51.30	1.90 0.86
1 1/2 x 1 1/2 x 2 40 x 40 x 50	840004485	D1556	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.



SPF Cast & Ductile Iron Fittings

www.anvilstar.com



BUSHINGS**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.



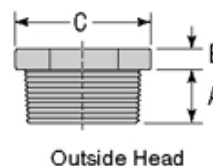
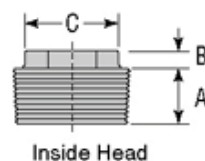
NOTICE: Ductile iron fittings have higher tensile strength than that of steel pipe. Therefore, over tightening can cause damage to pipe threads which may cause leakage. Ductile iron fittings should be tightened three turns beyond hand tight, but no more than four turns.



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For Listing/Approval Details and Limitations visit our Web Site www.anvilintl.com or contact an Anvil®/AnvilStar™ Sales Representative.

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 1/2 25 x 15	840600001	DBUSH31	0.75 19.05	0.25 6.35	1.42 36.06	Outside	0.22 0.10
1 x 3/4 25 x 20	840600019	DBUSH32	0.75 19.05	0.25 6.35	1.42 36.06	Outside	0.17 0.08
1 1/4 x 1 32 x 25	840600027	DBUSH43	0.80 20.32	0.28 7.11	1.76 44.70	Outside	0.28 0.13
1 1/2 x 1 40 x 25	840600035	DBUSH53	0.83 21.08	0.31 7.874	2.00 50.80	Outside	0.45 0.20
1 1/2 x 1 1/4 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 1 1/4 50 x 32	840600068	DBUSH64	0.88 22.35	0.34 8.636	2.48 62.99	Outside	0.73 0.33
2 x 1 1/2 50 x 40	840600076	DBUSH65	0.88 22.35	0.34 8.636	2.48 62.99	Outside	0.61 0.28





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.

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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
1 1/4 32	840005623	DCP004	500 3450	1.28 32.51	0.43 0.20
1 1/2 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**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.

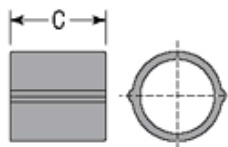
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**APPROVED**

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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	DQ.033	1.67 42.42	0.40 0.18
1 1/4 32	840008700	DQ.044	1.93 49.02	0.57 0.26
1 1/2 40	840008718	DQ.055	2.15 54.61	0.75 0.34
2 50	840008726	DQ.066	2.53 64.26	1.15 0.52

For additional listings and approvals, see the technical data section.



CROSS
ANVILStar
 Fire Products Division of Anvil International
Ductile Iron**MATERIAL SPECIFICATIONS**

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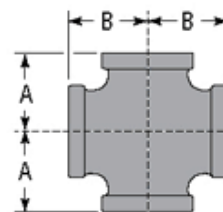


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CROSS						
Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions		Approx. Wt. Each
In. (mm)			PSI (kPa)	A In. (mm)	B In. (mm)	Lbs. (kg)
1 25	840006647	DX033	500 3450	1.50 38.10	1.50 38.10	0.98 0.44
1¼ 32	840006654	DX044	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.



SPF Cast & Ductile Iron Fittings

www.anvilstar.com


REDUCING 90° ELBOW



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

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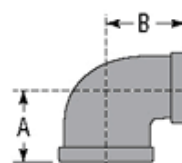
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REDUCING 90° ELBOW						
Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions		Approx. Wt. Each
In. (mm)			PSI (kPa)	A In. (mm)	B In. (mm)	Lbs. (kg)
1 x 1/2 25 x 15	840001036	0890031	500 3450	1.26 32.00	1.36 34.54	0.44 0.20
1 x 3/4 25 x 20	840001044	0890032	500 3450	1.37 34.79	1.45 36.83	0.52 0.24
1 1/4 x 1/2 32 x 15	840001051	0890041	500 3450	1.34 34.03	1.53 38.86	0.64 0.29
1 1/4 x 3/4 32 x 20	840001069	0890042	500 3450	1.45 36.83	1.62 41.14	0.72 0.33
1 1/4 x 1 32 x 25	840001077	0890043	500 3450	1.58 40.13	1.67 42.41	0.75 0.34
1 1/2 x 1 40 x 25	840001085	0890053	500 3450	1.65 41.91	1.80 45.72	0.92 0.42
1 1/2 x 1 1/4 40 x 32	840001093	0890054	500 3450	1.82 46.22	1.88 47.75	1.08 0.49
2 x 1/2 50 x 15	840001101	0890061	500 3450	1.49 37.84	1.88 47.75	1.08 0.49
2 x 3/4 50 x 20	840001119	0890062	500 3450	1.60 40.64	1.97 50.03	1.24 0.56
2 x 1 50 x 25	840001127	0890063	500 3450	1.73 43.94	2.02 51.30	1.40 0.64
2 x 1 1/4 50 x 32	840001135	0890064	500 3450	1.90 48.26	2.10 53.34	1.52 0.70
2 x 1 1/2 50 x 40	840001143	0890065	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.



SPF Cast & Ductile Iron Fittings

www.anvilstar.com



REDUCING COUPLING



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.

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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 1/2 25 x 15	840010755	DRC031	500 3450	1.69 42.92	0.39 0.18
1 x 3/4 25 x 20	840010763	DRC032	500 3450	1.69 42.92	0.53 0.24

* UL, ULC & FM Pressure Ratings

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SPF Cast & Ductile Iron Fittings

www.anvilstar.com



REDUCING TEE



Ductile Iron

MATERIAL SPECIFICATIONS

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* UL, ULC & FM Pressure Ratings

For additional listings and approvals, see the technical data section.

REDUCING TEE						
Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions		
				A	B	C
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	In. (mm)
1 x 1/2 x 1/2	840004196	D1313	500	1.50	1.36	1.50
25 x 15 x 25			3450	38.10	34.54	38.10
1 x 1/2 x 1/2	840004204	D1323	500	1.50	1.45	1.50
25 x 20 x 25			3450	38.10	36.83	38.10
1 x 1 x 1/2	840004212	D1331	500	1.26	1.26	1.36
25 x 25 x 15			3450	32.00	32.00	34.54
1 x 1 x 1/2	840004220	D1332	500	1.37	1.37	1.45
25 x 25 x 20			3450	34.80	34.80	36.83
1 x 1 x 1/2	840004238	D1334	500	1.67	1.67	1.58
25 x 25 x 32			3450	42.41	42.41	40.13
1 x 1 x 1/2	840004246	D1335	500	1.80	1.80	1.65
25 x 25 x 40			3450	45.72	45.72	41.91
1 1/2 x 1 x 1/2	840004253	D1431	500	1.34	1.26	1.53
32 x 25 x 15			3450	34.04	32.00	38.86
1 1/2 x 1 x 1/2	840004261	D1432	500	1.45	1.37	1.62
32 x 25 x 20			3450	36.83	34.80	41.15
1 1/2 x 1 x 1	840004279	D1433	500	1.58	1.50	1.67
32 x 25 x 25			3450	40.13	38.10	42.42
1 1/2 x 1 x 1/2	840004287	D1434	500	1.75	1.67	1.75
32 x 25 x 32			3450	44.45	42.42	44.45
1 1/2 x 1 x 1/2	840004295	D1435	500	1.88	1.80	1.82
32 x 25 x 40			3450	47.75	45.72	46.72
1 1/2 x 1 1/2 x 1/2	840004303	D1441	500	1.34	1.34	1.53
32 x 32 x 15			3450	34.04	34.04	38.86
1 1/2 x 1 1/2 x 1/2	840004311	D1442	500	1.45	1.45	1.62
32 x 32 x 20			3450	36.83	36.83	41.15
1 1/2 x 1 1/2 x 1	840004329	D1443	500	1.58	1.58	1.67
32 x 32 x 25			3450	40.13	40.13	42.42
1 1/2 x 1 1/2 x 1/2	840004337	D1445	500	1.88	1.88	1.82
32 x 32 x 40			3450	47.75	47.75	46.72
1 1/2 x 1 1/2 x 2	840004345	D1446	500	2.10	2.10	1.90
32 x 32 x 50			3450	53.34	53.34	48.76
1 1/2 x 1 x 1/2	840004352	D1531	500	1.41	1.34	1.66
40 x 25 x 15			3450	35.81	34.04	42.16
1 1/2 x 1 1/2 x 1/2	840004360	D1532	500	1.52	1.37	1.75
40 x 25 x 20			3450	38.61	34.80	44.45
1 1/2 x 1 x 1	840004378	D1533	500	1.65	1.50	1.80
40 x 25 x 25			3450	41.91	38.10	45.72
1 1/2 x 1 x 1/2	840004386	D1534	500	1.82	1.67	1.88
40 x 25 x 32			3450	46.23	42.42	47.75
1 1/2 x 1 x 1/2	840004394	D1535	500	1.94	1.80	1.94
40 x 25 x 40			3450	49.28	45.72	49.28
1 1/2 x 1 1/2 x 1/2	840004402	D1541	500	1.41	1.34	1.66
40 x 32 x 15			3450	35.81	34.04	42.16
1 1/2 x 1 1/2 x 1/2	840004410	D1542	500	1.52	1.45	1.75
40 x 32 x 20			3450	38.61	36.83	44.45
1 1/2 x 1 1/2 x 1	840004428	D1543	500	1.65	1.58	1.80
40 x 32 x 25			3450	41.91	40.13	45.72

REDUCING TEE						
Nominal Size	Anvil Item Number	Universal Number	Max. Working Pressure*	Dimensions		
				A	B	C
In. (mm)			PSI (kPa)	In. (mm)	In. (mm)	In. (mm)
1 1/2 x 1 1/2 x 2	840004436	D1546	500	2.16	2.10	2.02
40 x 32 x 50			3450	54.86	53.34	51.30
1 1/2 x 1 1/2 x 1/2	840004444	D1551	500	1.41	1.41	1.16
40 x 40 x 15			3450	35.81	35.81	29.46
1 1/2 x 1 1/2 x 1/2	840004451	D1552	500	1.52	1.52	1.75
40 x 40 x 20			3450	38.61	38.61	44.45
1 1/2 x 1 1/2 x 1	840004469	D1553	500	1.65	1.65	1.80
40 x 40 x 25			3450	41.91	41.91	45.72
1 1/2 x 1 1/2 x 1/2	840004477	D1554	500	1.82	1.82	1.88
40 x 40 x 32			3450	46.23	46.23	47.75
1 1/2 x 1 1/2 x 2	840004485	D1556	500	2.16	2.16	2.02
40 x 40 x 50			3450	54.86	54.86	51.30
2 x 1 x 2	840004493	D1636	500	2.25	2.02	2.25
50 x 25 x 50			3450	57.15	51.31	57.15
2 x 1 x 2	840004501	D1646	500	2.25	2.10	2.25
50 x 32 x 50			3450	57.15	53.34	57.15
2 x 1 1/2 x 1/2	840004519	D1651	500	1.49	1.41	1.88
50 x 40 x 15			3450	37.85	35.81	47.75
2 x 1 1/2 x 1/2	840004527	D1652	500	1.60	1.52	1.97
50 x 40 x 20			3450	40.64	38.61	50.04
2 x 1 1/2 x 1	840004535	D1653	500	1.73	1.65	2.02
50 x 40 x 25			3450	43.94	41.91	51.31
2 x 1 1/2 x 1/2	840004543	D1654	500	1.90	1.82	2.10
50 x 40 x 32			3450	48.26	46.23	53.34
2 x 1 1/2 x 1/2	840004550	D1655	500	2.02	1.94	2.16
50 x 40 x 40			3450	51.31	49.28	54.86
2 x 1 1/2 x 2	840004568	D1656	500	2.25	2.16	2.25
50 x 40 x 50			3450	57.15	54.86	57.15
2 x 2 x 1/2	840004576	D1661	500	1.49	1.49	1.88
50 x 50 x 15			3450	37.85	37.85	47.75
2 x 2 x 1/2	840004584	D1662	500	1.60	1.60	1.97
50 x 50 x 20			3450	40.64	40.64	50.04
2 x 2 x 1	840004592	D1663	500	1.73	1.73	2.02
50 x 50 x 25			3450	43.94	43.94	51.31
2 x 2 x 1 1/2	840004600	D1664	500	1.90	1.90	2.10
50 x 50 x 32			3450	48.26	48.26	53.34
2 x 2 x 1 1/2	840004618	D1665	500	2.02	2.02	2.16
50 x 50 x 40			3450	51.31	51.31	54.86
2 x 2 x 2 1/2	-	D1667	500	2.60	2.60	2.39
50 x 50 x 65			3450	66.04	66.04	60.33
2 1/2 x 2 x 1/2	-	D1762	500	1.74	1.60	2.32
65 x 50 x 20			3450	44.45	42.42	44.45

SPF Cast & Ductile Iron Fittings

www.anvilstar.com



STRAIGHT TEE



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.



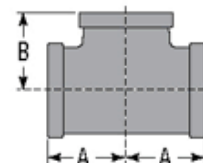
APPROVED

For Listing/Approval Details and Limitations visit our Web Site www.anvilintl.com or contact an Anvil®/AnvilStar™ Sales Representative.

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
1 1/4 32	840003172	DT444	500 3450	1.75 44.45	1.75 44.45	1.22 0.55
1 1/2 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.



SPF Cast & Ductile Iron Fittings

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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.

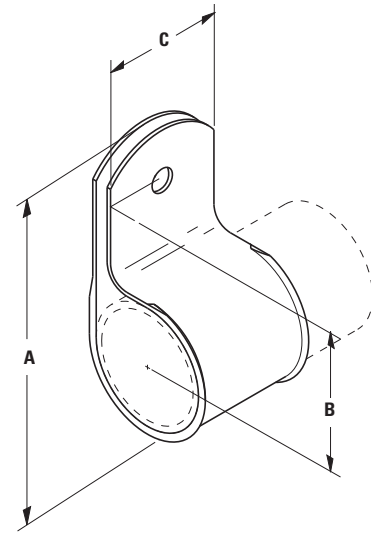
Features: Fig. 22 incorporates features which protect the pipe and ease installation. The flared edge design protects CPVC pipe from any rough surface. It is easily attached to the building structure using the special UL Listed hex head self threading screw* furnished with the product. It is recommended 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)	27/16" (61.9)	15/16" (33.3)	13/16" (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.

Pipe Clamps

Fig. 22L2 - One Hole Hanger/Restrainer for CPVC & Steel Pipe

TOLCO



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.

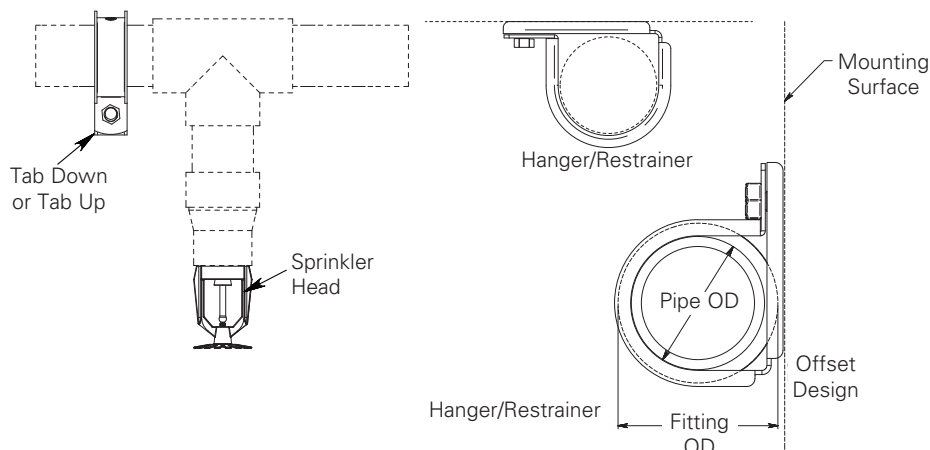
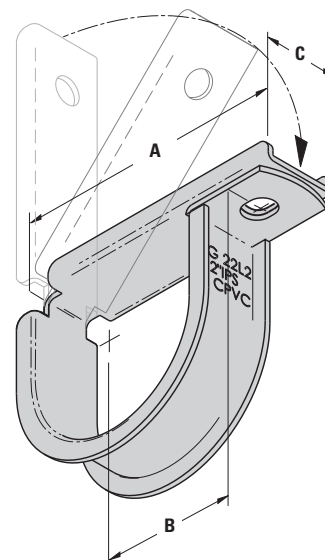
For Wood Installation — Test results have shown that #14 x 1 1/2" wood screws will support the required load for cUL us.

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)	1 5/16" (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)

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.

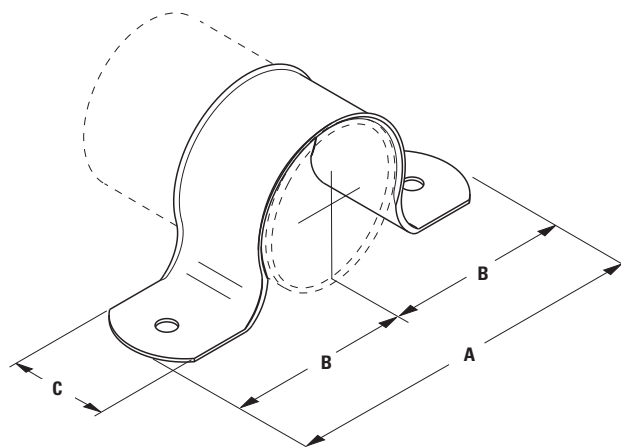
Features: Fig. 23 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. It also incorporates snap restrainers allowing easier and faster installation. Easily attaches to the building structure using the two UL Listed 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.

Pipe Clamps

Fig. 24 - Hanger for CPVC Plastic Pipe & IPS Steel Pipe**
Double Fastener Strap Side Mounted (B-Line B3183)

TOLCO



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.

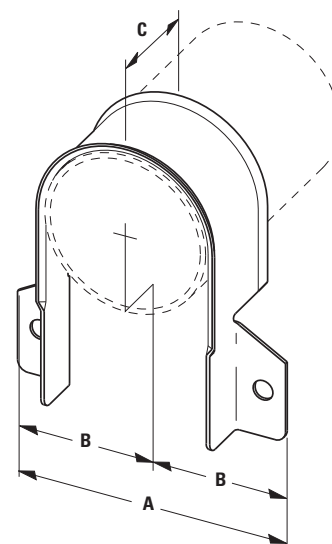
Features: Fig. 24 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. Easily attaches to the building structure using the two UL Listed hex head self threading screws* furnished with the product. It is recommended that 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)	25/16" (58.7)	15/32" (27.8)	13/16" (30.2)	5 1/2 (1.67)	5/16" (7.9)	9 (4.1)
24-1	1" (25)	25/8" (66.7)	15/16" (33.3)	13/16" (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)	13/16" (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)	13/16" (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)	13/16" (30.2)	8 (2.44)	5/16" (7.9)	15 (6.8)

Fig. 25 - Surge Restrainer

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

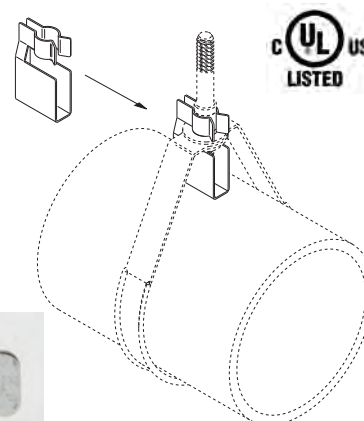


Fig. 27B - Speed Nut

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).



Fig. 27B
(1) Required High
Side of Hanger
Application

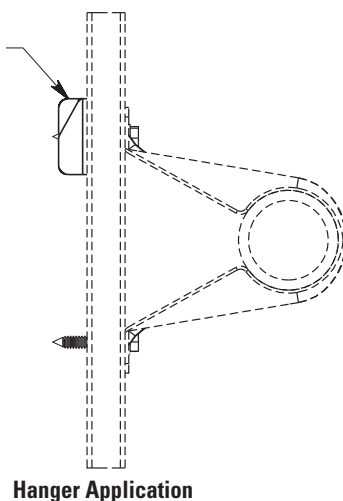
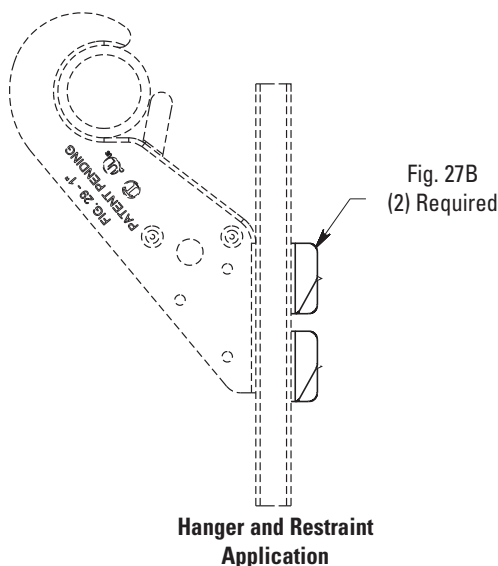
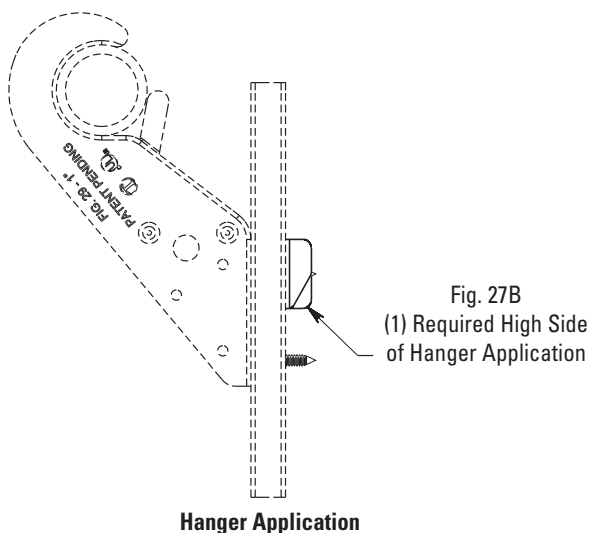
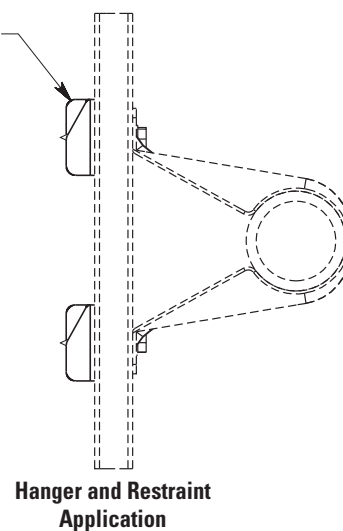


Fig. 27B
(2) Required



Pipe Clamps

Fig. 28 - "Stand-Off" Hanger & Restrainer for CPVC Plastic Pipe & IPS Steel Pipe **

TOLCO



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:

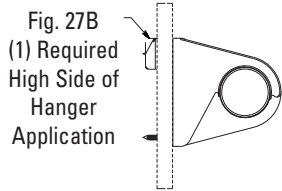
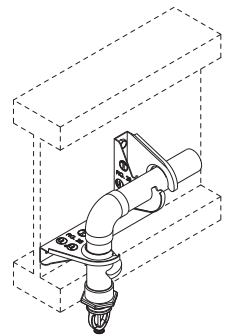
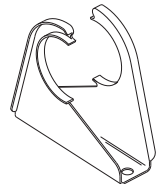
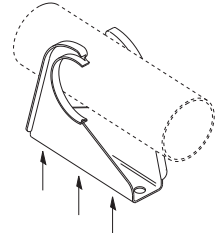
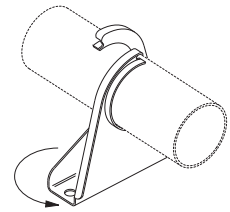
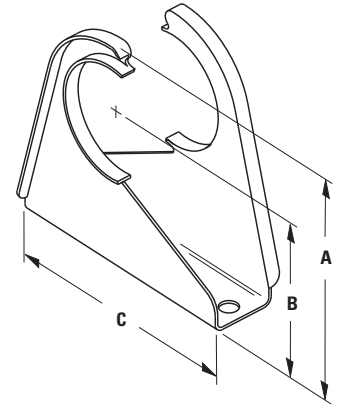
- Flared edge design protects CPVC pipe from any rough or abrasive surfaces.
- Unique twist and lock design holds pipe firmly in place and allows retrofit type of installation.
- The "Stand-Off" design eliminates the need for wood block extension.
- Can be installed on horizontal or vertical piping regardless 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.

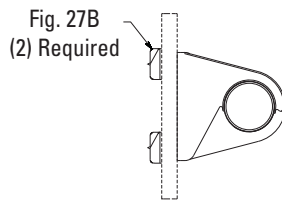
Order by: — Figure number and pipe size.

Pat. # 7,455,268, Pat. # 7,832,248

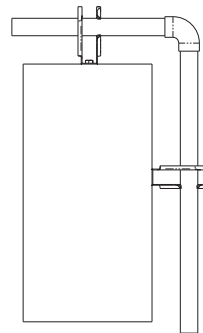
** With reduced spacing, consult factory.



Hanger Application



Hanger and Restraint Application



Part No.	Pipe Size in. (mm)	A in. (mm)	B in. (mm)	C in. (mm)	Max Hanger Spacing Ft. (m)	Approx. Wt./100 lbs. (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)

Fig. 28M - Offset Hanger & Restrainer for CPVC Plastic Pipe and IPS Steel Pipe **

TOLCO



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.

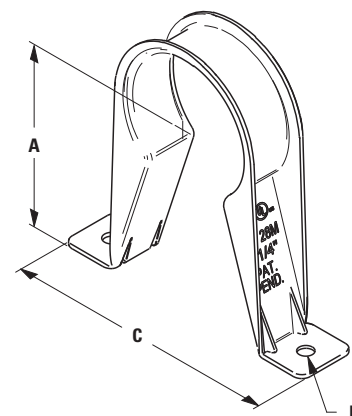
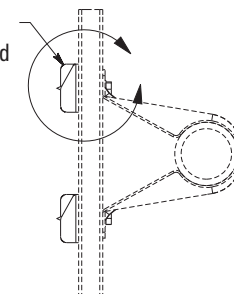
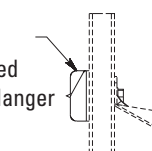


Fig. 27B
(2) Required

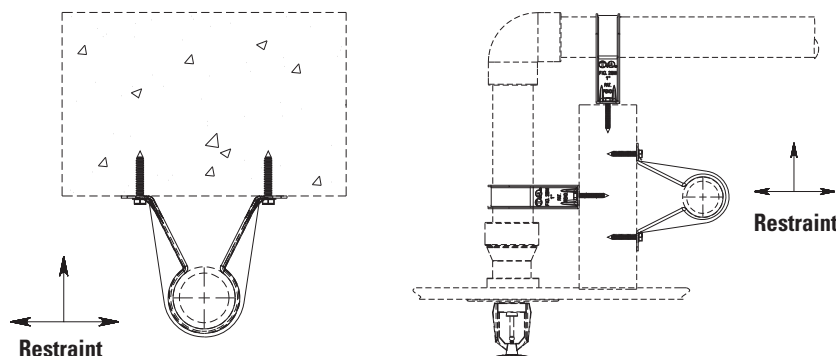


Hanger and Restraint Application

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)	35/16" (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.

Pipe Clamps

Fig. 29 - Double Offset Hanger & Restrainer for CPVC Plastic Pipe & IPS Steel Pipe**

TOLCO



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.

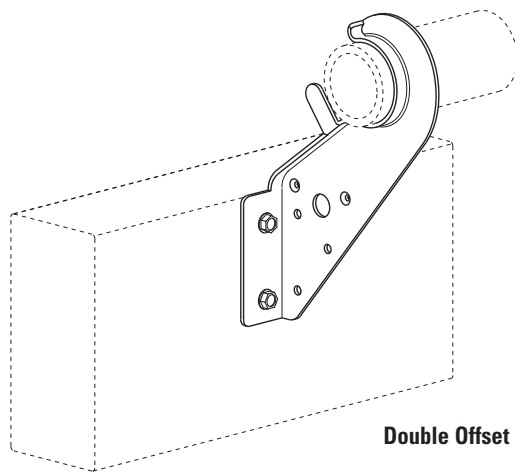
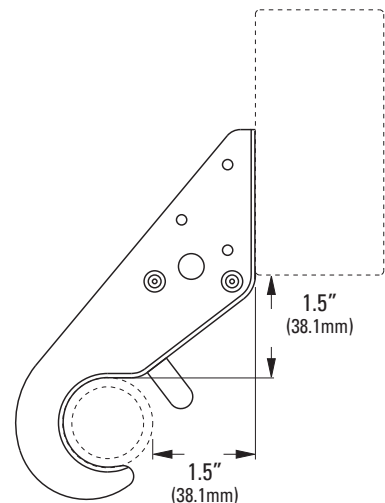
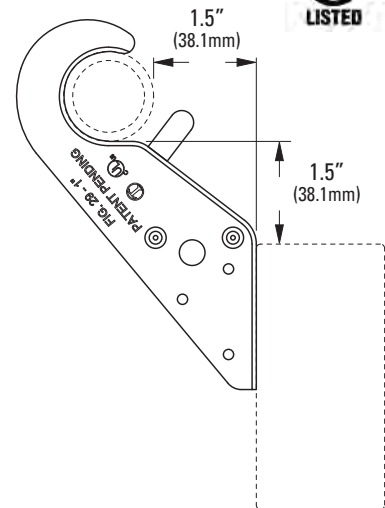
Approvals: Underwriters Laboratories Listed in the USA (**UL**) and Canada (**cUL**) as a hanger and restrainer to support fire sprinkler systems. Meets and exceeds requirements of NFPA 13, 13R and 13D.

Finish: Pre-Galvanized

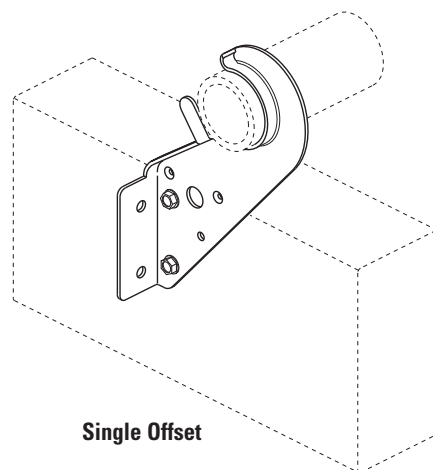
Order By: Figure number and pipe size.

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

TOLCO



Size Range: 3/4" (20mm) thru 2" (50mm)

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:

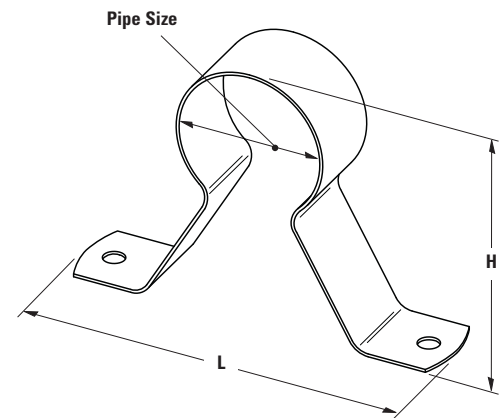
- Flared edge design protects CPVC pipe from any rough or abrasive surfaces
- The stand-off design eliminates the need for wood block extension
- Can be installed on horizontal or vertical piping regardless of mounting surface orientation
- Attaches easily to wood structure with two hex head self-threading 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)	29/16" (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).

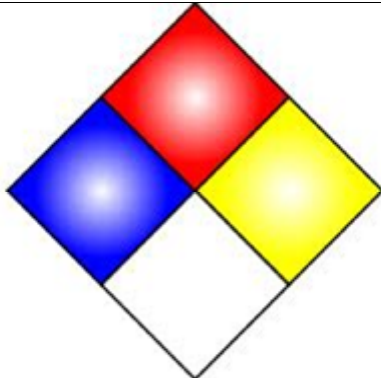


Fire Protection Products, Inc.
3198 Lionshead Avenue
Carlsbad, CA 92010
Phone: (760) 599-1168
Fax: (800) 344-3775

MATERIAL SAFETY DATA SHEET

Last Updated: 03/20/12

Section 1		CHEMICAL PRODUCT AND COMPANY IDENTIFICATION		
PTFE THREAD SEALING TAPE				
<u>Manufacturer Information</u> Fire Protection Products, Inc. 3198 Lionshead Avenue Carlsbad, CA 92010 Phone: (760) 599-1168 Fax: (800) 344-3775		<u>Emergency Contact</u> 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 ₂ , 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 ₂ O = 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



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

BlazeMaster® **TFP-500 One Step Solvent Cement** **MSDS (Material Safety Data Sheet)**

TYCO		MATERIAL SAFETY DATA SHEET		Date Revised: AUG 2007 Supersedes: APR 2007																																																																					
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																																																																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2"></th> <th rowspan="2">CAS#</th> <th rowspan="2">APPROX % BY WEIGHT</th> <th rowspan="2">ACGIH TLV</th> <th rowspan="2">ACGIH STEL</th> <th rowspan="2">OSHA PEL</th> <th rowspan="2">OSHA STEL</th> <th rowspan="2">LD50</th> <th rowspan="2">LC50</th> <th colspan="2">DUPONT</th> </tr> <tr> <th>(A) AEL</th> <th>(B) STEL</th> </tr> </thead> <tbody> <tr> <td>Chlorinated Polyvinyl Chloride Resin (CPVC)</td> <td>68648-82-8</td> <td>10 - 20</td> <td>N. AP.</td> <td></td> <td>N. AP.</td> <td></td> <td>N. AP.</td> <td>N. AP.</td> <td></td> <td></td> </tr> <tr> <td>Tetrahydrofuran (THF), Stabilized</td> <td>109-99-9</td> <td>30 - 60</td> <td>50 PPM Skin</td> <td>100 PPM Skin</td> <td>200 PPM</td> <td>250 PPM</td> <td>Oral: 2880 mg/kg (rat)</td> <td>Inhalation 3 hrs. 21,000 PPM (rat)</td> <td>50 PPM</td> <td>75 PPM</td> </tr> <tr> <td>Methyl Ethyl Ketone (MEK)</td> <td>78-93-3</td> <td>3 - 7</td> <td>200 PPM</td> <td>300 PPM</td> <td>200 PPM</td> <td>300 PPM</td> <td>Oral: 3.98 g/kg (rat) Dermal: 8-10 mg/kg (rabbit)</td> <td>Inhalation 4 hrs. 4,000 PPM (rat)</td> <td></td> <td></td> </tr> <tr> <td>Cyclohexanone</td> <td>108-94-1</td> <td>1 - 5</td> <td>20 PPM Skin</td> <td></td> <td>50 PPM</td> <td></td> <td>Oral: 1900 mg/kg (rat) Dermal: 1.0 g/kg (rabbit)</td> <td>Inhalation LCLO, 4 hrs: 2000 PPM (rat)</td> <td></td> <td></td> </tr> <tr> <td>Acetone</td> <td>67-64-1</td> <td>7 - 13</td> <td>500 PPM</td> <td>750 PPM</td> <td>750 PPM</td> <td>1000 PPM</td> <td>Oral: 9.75 g/kg (rat) Dermal: 20 g/kg (rabbit)</td> <td>Inhalation LCLO 4 hrs: 16,000 PPM (rat)</td> <td></td> <td></td> </tr> </tbody> </table>							CAS#	APPROX % BY WEIGHT	ACGIH TLV	ACGIH STEL	OSHA PEL	OSHA STEL	LD50	LC50	DUPONT		(A) AEL	(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)		
	CAS#	APPROX % BY WEIGHT	ACGIH TLV	ACGIH STEL	OSHA PEL										OSHA STEL	LD50	LC50	DUPONT																																																							
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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/MDG SHIPPING INFORMATION Proper Shipping Name: Adhesives Hazard Class: 3 Identification Number: UN 1133 Packing Group: II Label Required: Flammable Liquid 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 <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>HMIS</th> <th>NFPA</th> <th>HAZARD RATING</th> </tr> </thead> <tbody> <tr> <td>HEALTH:</td> <td>2</td> <td>2</td> <td>0 - MINIMAL</td> </tr> <tr> <td>FLAMMABILITY:</td> <td>3</td> <td>3</td> <td>1 - SLIGHT</td> </tr> <tr> <td>REACTIVITY:</td> <td>0</td> <td>1</td> <td>2 - MODERATE</td> </tr> <tr> <td>PROTECTIVE EQUIPMENT:</td> <td>B - H</td> <td></td> <td>3 - SERIOUS</td> </tr> <tr> <td></td> <td></td> <td></td> <td>4 - SEVERE</td> </tr> </tbody> </table> B = Eye, Hand/Skin (for normal solvent-welding activities) H = Eye, Hand/Skin, Respiratory Protection and Impermeable Apron (splash/immersion risks)			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																																												
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SECTION III - PHYSICAL DATA																																																																									
APPEARANCE Red, medium syrupy liquid		ODOR Ethereal (Threshold = 2-50 PPM)		BOILING POINT (°F/°C) 133°F (57°C) FREEZING POINT -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
-6°F (-21°C) T.C.C. Based on Acetone		609.8°F (321°C), THF		(PERCENT BY VOLUME)
				LEL
				2.0
				UEL
				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	UNSTABLE		CONDITIONS TO AVOID	
	STABLE	X	Keep away from heat, sparks, open flame and other sources of ignition.	
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	MAY OCCUR		CONDITIONS TO AVOID	
	WILL NOT OCCUR	X	Keep away from heat, sparks, open flame and other sources of ignition.	
SECTION VI - HEALTH HAZARD DATA & TOXICOLOGICAL PROPERTIES				
PRIMARY ROUTES OF ENTRY: <u> X </u> Inhalation <u> X </u> Skin Contact <u> </u> Eye Contact <u> </u> 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:				
<u>Inhalation:</u> Severe overexposure may result in nausea, dizziness, headache. Can cause drowsiness, irritation of eyes and nasal passages.				
<u>Skin Contact:</u> Skin irritant. Liquid contact may remove natural skin oils resulting in skin irritation. Dermatitis may occur with prolonged contact.				
<u>Skin Absorption:</u> Prolonged or widespread exposure may result in the absorption of harmful amounts of material.				
<u>Eye Contact:</u> Overexposure may result in severe eye injury with corneal or conjunctival inflammation on contact with the liquid. Vapors slightly uncomfortable.				
<u>Ingestion:</u> 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
N. AP.		N. AP.	N. AP.	N. AP.
				SENSITIZATION TO PRODUCT
				N. AP.
				SYNERGISTIC PRODUCTS
				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:	Telephone number:	e-mail address
IPS Safety, Health & Environmental Affairs Department	(310) 898-3300	<richard.winn@ipscorp.com>

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of this data or the results to be obtained from the use thereof.

fff-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®

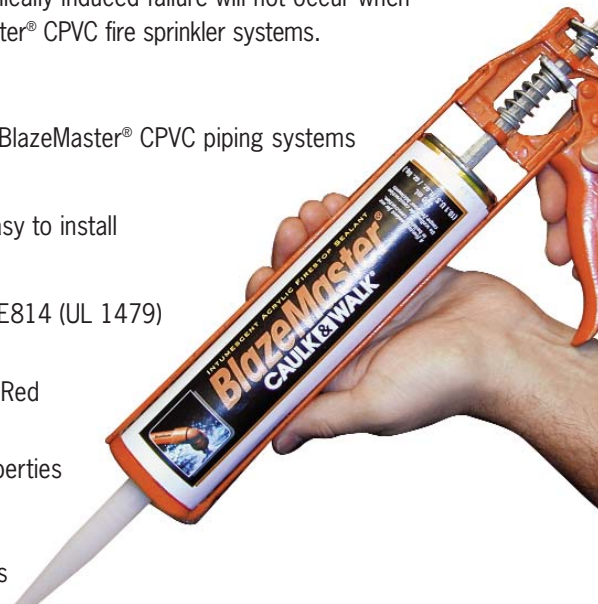


1 or 2 Hour Fire Rated Through Penetration Firestop for Single Plastic Pipe through Gypsum Walls using BlazeMaster® Caulk & Walk®

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

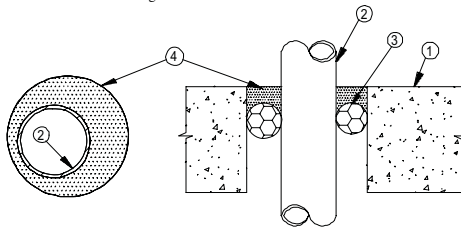
PENETRATING ITEM		CONCRETE	GYPSUM	WOOD FRAME
PLASTIC PIPE	CPVC	C-AJ-2221	WL-2151	F-C-2199
	PVC	C-AJ-2221	WL-2151	F-C-2199
METALLIC PIPE		C-AJ-1304	WL-1147	F-C-1083
INSULATED PIPE	Fiberglass	C-AJ-5181	WL-5155	F-C-5047
	AB/PVC	N/A	WL-5154	F-C-5047

CONCRETE ASSEMBLIES

2 Hour Fire Rated Through Penetration Firestop for Single Plastic Pipe through Concrete Floors or Walls using BlazeMaster® Caulk & Walk®

F-Rating = 2 Hr.
T-Rating = 1-1/2 Hr.

Drawing not to scale



- 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

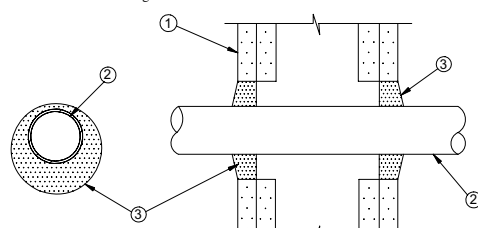
Project: _____	The Tremco products used above have been tested in accordance with the following: • ASTM E814 (UL1479) Standard Test Method for Through Penetration Firestopping. This information is intended for engineering purposes only and is based on internal and third party testing which we believe 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.
Location: _____	
Installer: _____	
Signature: _____	
Date: 10/29/01	Drawing: BCW-2221
Approved by: _____	J. Pitcole

GYPSUM WALL ASSEMBLIES

1 or 2 Hour Fire Rated Through Penetration Firestop for Single Plastic Pipe through Gypsum Walls using BlazeMaster® Caulk & Walk®

F-Rating = 1 & 2 Hr.
T-Rating = 1 & 2 Hr.

Drawing not to scale



- 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: _____	The Tremco products used above have been tested in accordance with the following: • ASTM E814 (UL1479) Standard Test Method for Through Penetration Firestopping. 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.
Location: _____	
Installer: _____	
Signature: _____	
Date: 10/29/01	Drawing: BCW-2151
Approved by: _____	J. Pitcole

Lubrizol

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For technical questions about installation and use
please contact Tremco, Inc. 800-321-7906



Manufactured by **TREMCO**
Information: 216-292-5000 800-321-7906

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