

FireLock® LP-46 Low Pressure Storage Sprinkler



SEE VICTAULIC PUBLICATION 10.01 FOR DETAILS

Model LP-46 (SIN) V4603, K25, Standard Response Storage Upright Sprinkler, Patent Pending

MODEL LP-46

This storage sprinkler was designed for controlling fires in single, double and multiple row rack storage of up to Cartoned, Unexpanded, Group A plastic commodities stored up to 25 feet/7.6 meters in height under a maximum 30 foot/9 meter high ceiling without the need for in-rack sprinklers. It may also be used on a dry sprinkler system protecting commodity hazards up to and including cellulosic products (class 3) under a maximum 40ft/12.2m ceiling height. These sprinklers utilize a standard response, fusible element, stainless steel operating components and a Teflon coated spring seal. The Model LP-46 has a K-Factor of 25.2 imp/36.8 S.I.

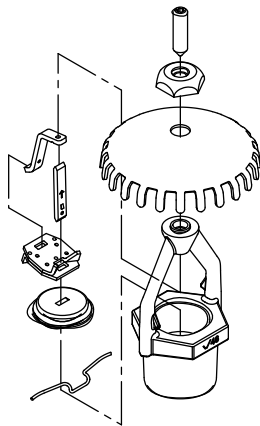


UPRIGHT V4603
PATENT PENDING

SPRINKLER OPERATION:

The operating mechanism is a durable, standard response, fusible solder link. During a fire, the ambient temperature rises causing the solder to melt. When the ambient temperature reaches the rated temperature of the sprinkler, the link fuses. As a result, the waterway is cleared of all sealing parts and water is discharged towards the deflector. The deflector is designed to distribute the water in a pattern that is most effective in controlling rapidly growing storage fires.

TECHNICAL SPECIFICATIONS:



Exaggerated for clarity

- Model:** LP-46 (SIN V4603)
- Style:** Upright
- K-Factor:** 25.2 Imp/(36.8 S.I.)[^]
- Nominal Thread Size:** 1" NPT/25mm BSPT
- Max. Working Pressure:** 175 psi/1200 kPa
- Factory Hydrostatic Test:** 100% @ 500 psi/3450 kPa
- Min. Operating Pressure:** Application specific
- Temperature Rating:** See chart on page 2.

MATERIAL SPECIFICATIONS

- Deflector:** Bronze per UNS C51000
- Link:** Nickel per UNS N02200
- Lever:** Monel per UNS N04400
- Load Screw:** Stainless Steel per UNS S31600
- Cap:** Stainless steel per UNS S31600
- Seal:** Teflon* tape
- Strutt:** Monel per UNS N04400
- Frame:** Proprietary Dezincification Resistant Die-Cast Brass
- Spring:** Stainless Steel per UNS S30200

ACCESSORIES

Installation Wrench:

- Open End: V46

Sprinkler Finishes:

- Plain brass

For cabinets and other accessories, refer to separate sheet.

[^] For K-Factor when pressure is measured in Bar, multiply S.I. units by 10.0.

* Teflon is a registered trademark of Dupont Co.

JOB/OWNER

System No. _____
Location _____

CONTRACTOR

Submitted By _____
Date _____

ENGINEER

Spec Sect _____ Para _____
Approved _____
Date _____

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APPROVALS/LISTINGS

Model	Nominal K-Factor Imperial S.I. [^]	Response	Deflector Type	FM Approved Temperature Ratings ‡
V4603	25.2 36.8	Standard	Upright	A

[^] For K-Factor when pressure is measured in Bar, multiply S.I. units by 10.0.

[‡] Listings and approvals as of printing.

TEMPERATURE RATINGS

Approval	Temperature Rating
A	162°F/72°C, 212°F/100°C, 286°F/141°C

162°F/72°C rated sprinklers should be used whenever possible. 212°F/100°C temperature rated sprinklers are listed and approved for use adjacent to unit heaters or throughout the building when the ceiling temperatures consistently exceed 100°F/38°C.

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SYSTEM DESIGN AND LISTING REQUIREMENTS PER FM GLOBAL



SCOPE

The Victaulic Company (Victaulic) model V4603 sprinkler has recently been FM Approved for installation on 1 in. (25 mm) NPT fittings. This control-mode specific-application (CMSA) upright sprinkler has a K25.2 (K360) K-factor value and is available in a nominal temperature rating of 160°F (70°C), 212°F (100°C), and 286°F (141°C). Full-scale fire testing has demonstrated that when this sprinkler is operating at a minimum pressure of 20 psi (1.4 bar) on a wet-type sprinkler system, it can protect commodity hazards up to and including cartoned unexpanded plastics when stored under ceiling heights not exceeding 30 ft (9.0 m). Full-scale fire testing has also demonstrated that when this sprinkler is operating at a minimum pressure of 15 psi (1.0 bar) on a dry-type sprinkler system, it can protect commodity hazards up to and including cellulosic products (Class 3) when stored under ceiling heights not exceeding 40 ft (12.0 m). Guidelines for the sprinkler's installation are provided below.

LOSS PREVENTION RECOMMENDATIONS

Install the Victaulic V4603 upright CMSA automatic sprinkler in accordance with the following guidelines:

1. **Application:** This FM Approved CMSA sprinkler may be used to protect Class 1 through Class 4 commodities, as well as cartoned unexpanded plastics (but not cartoned expanded plastics nor any uncartoned plastics) under ceiling heights not exceeding 30 ft (9.0 m). In addition, this sprinkler may be used to protect Class 1 through Class 3 commodities under ceiling heights not exceeding 40 ft (12.0 m). The sprinkler may be used to protect these commodities when maintained in storage arrangements consisting of solid-piled, palletized, shelf, bin-box, and open-frame racks. The sprinkler can also be used to protect portable rack storage if the portable racks meet the requirements for them to be considered open-frame racks (see DS 8-9, Storage of Class 1, 2, 3, 4, and Plastic Commodities). For all storage arrangements, maintain a minimum 3 ft (0.9 m) clearance between the top of storage and the sprinkler deflector.

2. **Temperature Rating** – The Victaulic model V4603 sprinkler is available in nominal temperature ratings of 160°F (70°C), 212°F (100°C), and 286°F (141°C). Use the nominally rated 160°F (70°C) sprinkler for all acceptable applications on a wet-type sprinkler system unless the ambient temperature of the protected occupancy requires the nominal temperature rating to be 212°F (100°C). Use the nominally rated, 286°F (141°C) sprinkler for all acceptable applications on a dry-type sprinkler system.

3. **Hydraulic Design:** Base the wet-type sprinkler system design requirements for the Victaulic model V4603 sprinkler on a minimum operating pressure of 20 psi (1.4 bar) over the most remote 12 sprinklers with an allowance of 250 gpm (950 L/min) for manual extinguishment and a minimum duration of 60 minutes. Base the dry-type sprinkler system design requirements for the Victaulic model V4603 sprinkler on a minimum operating pressure of 15 psi (1.0 bar) over the most remote 24 sprinklers with an allowance of 500 gpm (1,900 L/min) for manual extinguishment and a minimum duration of 120 minutes. This pressure must be reached and maintained within a timeframe of 25 seconds upon first sprinkler actuation.

Note that the 25-second delivery time needs to be confirmed via an analysis by Engineering Standards or a software program listed in the Specification Tested Product section of the Approval Guide, an online resource of FM Approvals. If confirmed by the software program, base the sprinkler operation sequence on the simultaneous opening of the four most-remote sprinklers (two sprinklers on two lines).

Commodity Hazards Other Than Class 1 through 4 and Cartoned Plastics: The Victaulic V4603 K25.2 (K360) upright sprinkler can be used to protect any commodity hazard that can be protected by the K11.2, upright CMSA sprinkler. Base the design for the K25.2 upright sprinkler on the same design requirement for the K11.2 sprinkler, however the minimum required pressure shall be 15 psi. Refer to FM Engineering Bulletin 02-09.

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4. **Shape of Operating Area:** Base the shape of the operating area on a 1.2 shape factor for ceiling slopes up to 5°, or a 1.4 shape factor for ceiling slopes over 5° and up to 10°.

For a wet-type sprinkler system, base the number of sprinklers in the operating area parallel to the branchline on the following equation:

Number of AS in operating area parallel to branchline = (shape factor / on-line AS spacing) x (12 x area spacing of sprinklers)^{0.5}.

For a dry-type sprinkler system, base the number of sprinklers in the operating area parallel to the branchline on the following equation:

Number of AS in operating area parallel to branchline = (shape factor / on-line AS spacing) x (24 x area spacing of sprinklers)^{0.5}.

Round these equations to the nearest whole number using standard rounding methods (i.e., round down if the resulting fraction is 0.49 or less, and round up if the resulting fraction is 0.50 or greater).

5. **System Type:** For the wet-type sprinkler system designs outlined above, wet-pipe sprinkler systems or pre-action sprinkler systems whose sprinkler protection design can be based on the equivalent of a wet-pipe system are acceptable. For the dry-type sprinkler system designs outlined above, dry-pipe sprinkler systems, pre-action sprinkler systems whose sprinkler protection design can be based on the equivalent of a wet-pipe system or refrigerated area sprinkler systems are acceptable.

6. **Sprinkler Spacing:** For ceiling heights up to and including 30 ft. (9.0 m), the minimum and maximum linear distances between sprinklers are 8 ft (2.4 m) and 12 ft (3.6 m) respectively. The minimum and maximum areas of coverage per sprinkler are 80 ft² (7.5 m²) and 100 ft² (9.3 m²) respectively. For ceiling heights over 30 ft. (9.0 m), the maximum linear distance between sprinklers decreases to 10 ft (3.0 m), while the minimum and maximum areas of coverage per sprinkler remain the same.

7. **Sprinkler Location from Walls:** Locate the automatic sprinklers with respect to walls as follows (measured perpendicular to the wall):

- Minimum horizontal distance: 4 in. (100 mm)
- Maximum horizontal distance unless indicated otherwise in either the occupancy-specific operating standard or the *Approval Guide*:
 - (a) Wall angle greater than 90°: 5 ft (1.5 m)
 - (b) Wall angle equal to or less than 90°: 7 ft (2.1 m)

8. **Sprinkler Location from Ceilings:** Locate the centerline of the automatic sprinkler's thermal sensing element with respect to the vertical distance below ceilings as follows:

- Minimum vertical distance: 2 in. (50 mm) for smooth ceilings or 4 in. (100 mm) for nonsmooth ceilings
- Maximum vertical distance: 11 in. (275 mm)

9. **Obstructions:** Although the Victaulic model V4603 is not considered a suppression-mode sprinkler, follow the obstruction requirements for upright suppression-mode sprinklers in DS 2-2, *Installation Rules for Suppression Mode Automatic Sprinklers*.

SUPPORT FOR RECOMMENDATIONS

The Victaulic model V4603 CMSA upright sprinkler has successfully undergone mechanical inspection and performance evaluation testing in accordance with FM Approval Standard Class 2000, as well as full-scale fire testing for the protection of commodity hazards up to and including cartoned unexpanded plastics under a ceiling height not exceeding 30 ft (9.0 m) as well as commodity hazards up to and including Class 3 materials under a ceiling height not exceeding 40 ft (12.0 m). Acceptable storage arrangements include solid-piled, palletized, shelf, bin-box, and openframe storage racks. Portable racks are also acceptable if they meet the requirements for them to be considered open-frame racks (see DS 8-9).

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FM DESIGN CRITERIA



WET SYSTEM – Palletized, solid pile, Bin-Box, Single-, Double-, and Multiple Rack Storage (without solid shelves) storage of class I-IV and plastic commodities for storage maintained under ceiling heights up to and including 30 ft (9.1 m) using Control Mode Specific Application pendent sprinkler LP-46.

Configuration	Commodity Class	Maximum Ceiling/ Roof Height	Minimum Operating Area	Minimum Operating Pressure
Palletized and Solid Piles, Shelf or Bin-Box, and Open Frame (no open-top containers or solid shelves)	Class I-IV and Cartoned Plastics	30 ft* 9.1 m	1200 ft ² (111.5 m ²)	20 psi 138 kPa

*Hose Stream allowance 250 gpm (950 lpm) for manual extinguishment and a minimum duration of 60 minutes.

DRY SYSTEM – Palletized, solid pile, Bin-Box, Single-, Double-, and Multiple Rack Storage (without solid shelves) storage of class I-III for storage maintained under ceiling heights up to and including 40 ft (12.2 m) using Control Mode Specific Application upright sprinkler LP-46.

Configuration	Commodity Class	Maximum Ceiling/ Roof Height	Minimum Operating Area	Minimum Operating Pressure
Palletized and Solid Piles, Shelf or Bin-Box, and Open Frame (no open-top containers or solid shelves)	I-III	40 ft* 12.2 m*	1200 ft ² (111.5 m ²)	15 psi 103 kPa

*Hose Stream allowance 500 gpm (950 lpm) for manual extinguishment and a minimum duration of 120 minutes.

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RATINGS

All links are rated for temperatures from -67°F/-55°C to those shown in table below.

Sprinkler Temperature Classification	Victaulic Part Identification	Temperature – °F/°C		Link Color
		Nominal Temperature Rating	Maximum Ambient Temperature Allowed	
Ordinary	N	162 72	100 38	Black/None
Intermediate	G	212 100	150 65	Black with White Dot/ White arms
High	J	286 141	225 107	Black with Blue Dot

ORDERING INFORMATION




Please specify the following when ordering:

Sprinkler Model Number	
Style	
Temperature Rating	
K-Factor	
Thread Size	
Quantity	
Sprinkler Finish	
Escutcheon Finish	
Wrench Model Number	

WARNING



WARNING

- Always read and understand installation, care, and maintenance instructions, supplied with each box of sprinklers, before proceeding with installation of any sprinklers.
- Always wear safety glasses and foot protection.
- Depressurize and drain the piping system before attempting to install, remove, or adjust any Victaulic piping products.
- Installation rules, especially those governing obstruction, must be strictly followed.
- Painting, plating, or any re-coating of sprinklers (other than that supplied by Victaulic) is not allowed.

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

The owner is responsible for maintaining the fire protection system and devices in proper operating condition. For minimum maintenance and inspection requirements, refer to the current National Fire Protection Association pamphlet that describes care and maintenance of sprinkler systems. In addition, the authority having jurisdiction may have additional maintenance, testing, and inspection requirements that must be followed.

If you need additional copies of this publication, or if you have any questions about the safe installation of this product, contact Victaulic World Headquarters: P.O. Box 31, Easton, Pennsylvania 18044-0031 USA, Telephone: 001-610-559-3300.

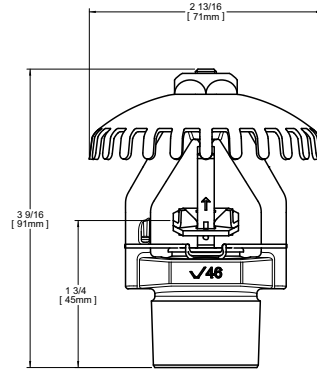
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DIMENSIONS

Standard Upright – LP-46 (SIN V4603)



AVAILABLE WRENCHES

Sprinkler Type	Open End
LP-46 (SIN V4603) Upright	V46

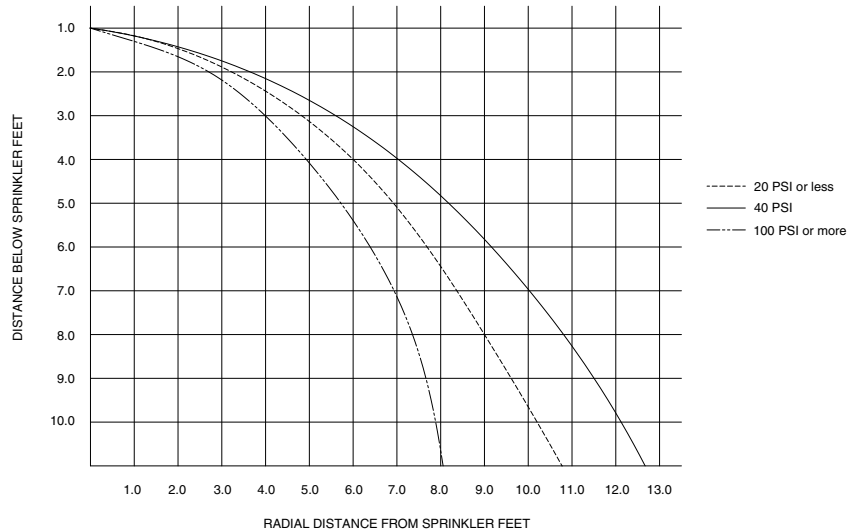
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NOMINAL WETTING PATTERNS

**Model LP-46 (SIN V4603)
Upright Spray Pattern**



NOTES:

- 1 Data shown is approximate and can vary due to differences in installation.
- 2 These graphs illustrate approximate wetting patterns for these specific Victaulic FireLock Automatic Sprinklers. They are provided as information for guidance and should not be used as minimum sprinkler spacing rules for installation. Sprinkler location shall be in accordance with FM Global Engineering Bulletin and/or Data Sheets. Failure to follow these guidelines could adversely affect the performance of the sprinkler and will void all Listings, Approvals and Warranties.
- 3 All patterns are symmetrical to the waterway.

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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

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