

# FireLock® LP-46 Low Pressure Storage Sprinkler



SEE VICTAULIC PUBLICATION 10.01 FOR DETAILS

Model LP-46 (SIN) V4603, K25.2, Standard Response Storage Upright Sprinkler

**MODEL LP-46**

This storage sprinkler was designed for controlling fires in single, double and multiple row solid piled, palletized, shelf, bin-box, and open-frame rack storage of commodity hazards up to and including cellulosic products (Class III) under a maximum 45ft/13.7m (40ft/12.2m storage) ceiling height as well as up to Cartoned, Unexpanded, Group A plastic commodities under a maximum 30 ft/9.1m (25 ft/7.6m storage) ceiling without the need for in-rack sprinklers.

This sprinkler utilizes 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.

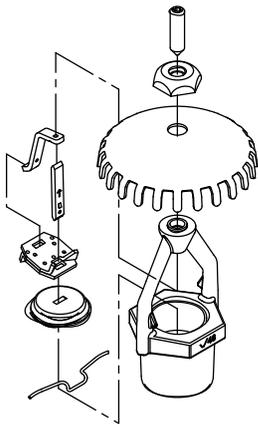


UPRIGHT V4603

**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.)<sup>^</sup>

**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

**Strut:** 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.

<sup>^</sup> 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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# FireLock® LP-46 Low Pressure Storage Sprinkler

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## MODEL LP-46

### APPROVALS/LISTINGS

Model	Nominal K-Factor Imperial S.I. <sup>^</sup>	Response	Deflector Type	FM Approved Temperature Ratings ‡
V4603	25.2 36.8	Standard	Upright	162°F/72°C 212°F/100°C 286°F/141°C

<sup>^</sup> For K-Factor when pressure is measured in Bar, multiply S.I. units by 10.0.

‡ Listings and approvals as of printing.

### TEMPERATURE RATINGS

Use the nominally rated 162°F/72°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. The nominally rated, 286°F/141°C sprinkler is required for all acceptable dry-type applications and can also be used on applicable wet type systems, when required.

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

### SYSTEM DESIGN AND LISTING REQUIREMENTS PER FM GLOBAL



### LOSS PREVENTION RECOMMENDATIONS

For wet systems up to 40 ft/12.2m and dry systems up to 30 ft/9.1m, and dry systems over 30 ft/9.1m, see FM Data Sheet 8-9. Ensure the required pressure is reached and maintained within the time frame mandated by FM Global.

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

TABLE ONE LP-46 Upright (V4603) for Wet Systems Class I - IV and Cartoned Unexpanded Group A Plastic Solid-Piled, Palletized, Shelf or Bin-Box arrangements Without Need for In-Rack Sprinklers		
Up to 40ft/12.2m high ceiling and up to 35ft/10.7m high storage	Number of Sprinklers	24*
	Discharge Pressure (psi/kPa)	15/103*
	System Demand (gpm/lpm)	2342/8865*
	Hose Stream Demand	500gpm(1893lpm)/120min
Up to 35ft/10.7m high ceiling and up to 25ft/7.6m high storage	Number of Sprinklers	15*
	Discharge Pressure (psi/kPa)	15/103*
	System Demand (gpm/lpm)	1464/5542*
	Hose Stream Demand	500gpm(1893lpm)/90min
Up to 30ft/9.1m high ceiling and up to 15 ft/4.6m high storage	Number of Sprinklers	12
	Discharge Pressure (psi/kPa)	20/138
	System Demand (gpm/lpm)	1352/5118
	Hose Stream Demand	250gpm(946lpm)/60min

\* Up to Class III Commodities only

Data based upon FM Global Loss Prevention Data Sheet 8-9

10ft x 10ft/3m x 3m deflector spacing, 12"/305mm thermal element to ceiling distance

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### SYSTEM DESIGN AND LISTING REQUIREMENTS PER FM GLOBAL



<b>TABLE TWO</b> <b>LP-46 Upright (V4603) for Wet Systems</b> <b>Class I-IV and Cartoned Unexpanded Group A Plastic</b> <b>Solid-Piled, Palletized, Shelf or Bin-Box Arrangements</b> <b>Open Frame Rack Storage Arrangements Without Need for In-Rack Sprinklers</b>		
Up to 40ft/12.2m high ceiling and up to 35ft/10.7m high storage	Number of Sprinklers	24*
	Discharge Pressure (psi/kPa)	15/103*
	System Demand (gpm/lpm)	2342/8865*
	Hose Stream Demand	500gpm(1993lpm)/120min
Up to 30ft/9.1m high ceiling and up to 25ft/7.6m high storage	Number of Sprinklers	12
	Discharge Pressure (psi/kPa)	20/138
	System Demand (gpm/lpm)	1352/5118
	Hose Stream Demand	250gpm(946lpm)/60min

\* Up To Class III Commodities Only

<b>TABLE THREE</b> <b>LP-46 Upright (V4603) for Refrigerated and Freezer</b> <b>Dry/Preaction Systems</b> <b>Class I - III Commodity Storage</b> <b>Solid-Piled, Palletized, Shelf or Bin-Box arrangements without need for in-rack sprinklers</b>		
<b>Storage Up To:</b>		
Up to 45ft/13.7m high ceiling and up to 40ft/12.2m high storage	Number of Sprinklers	12*
	Discharge Pressure (psi/kPa)	50/345*
	System Demand (gpm/lpm)	2140/8101*
	Hose Stream Demand	500gpm(1893lpm)/90min
Up to 40ft/12.2m high ceiling and up to 35ft/10.7m high storage	Number of Sprinklers	24**
	Discharge Pressure (psi/kPa)	15/103**
	System Demand (gpm/lpm)	2342/8865**
	Hose Stream Demand	500gpm(1893lpm)/120min
Up to 35ft/10.7m high ceiling and up to 30ft/9.1m high storage	Number of Sprinklers	20
	Discharge Pressure (psi/kPa)	7/48
	System Demand (gpm/lpm)	1333/5046
	Hose Stream Demand	500gpm(1893lpm)/120min

\* Based upon water delivery of 20 seconds or less

\*\* Based upon water delivery of 25 seconds or less

Data based upon FM Global Loss Prevention Data Sheet 8-9

10ft x 10ft/3m x 3m deflector spacing, 12"/305mm thermal element to ceiling distance

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### SYSTEM DESIGN AND LISTING REQUIREMENTS PER FM GLOBAL



TABLE FOUR LP-46 Upright (V4603) for Refrigerated and Freezer Dry/Preaction Systems Class I - III Commodity Storage Open Frame Rack Storage after arrangements without need for in-rack sprinklers		
Storage Up To:		
Up to 45ft/13.7m high ceiling and up to 40ft/12.2m high storage	Number of Sprinklers	12*
	Discharge Pressure (psi/kPa)	50/345*
	System Demand (gpm/lpm)	2140/8101*
	Hose Stream Demand	500gpm(1893lpm)/90min
Up to 40ft/12.2m high ceiling and up to 35ft/10.7m high storage	Number of Sprinklers	24**
	Discharge Pressure (psi/kPa)	15/103**
	System Demand (gpm/lpm)	2342/8865**
	Hose Stream Demand	500gpm(1893lpm)/120min
up to 30ft/9.1m high ceiling and up to 25ft/7.6m high storage	Number of Sprinklers	25
	Discharge Pressure (psi/kPa)	10/69
	System Demand (gpm/lpm)	1992/7541
	Hose Stream Demand	500gpm(1893lpm)/120min

\* Based upon water delivery of 20 seconds or less

\*\* Based upon water delivery of 25 seconds or less

Data based upon FM Global Loss Prevention Data Sheet 8-9

10ft x 10ft/3m x 3m deflector spacing, 12"/305mm thermal element to ceiling distance.

Note: The water 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).

Operating Area and Hose Stream Demand Requirements		
Number of Sprinklers*	Hose Demand (gpm/lpm)	Duration (minutes)
12**	250/946	60
13-15**	500/1893	90
16	500/1893	120

\* One sprinkler for every 100 sq ft/9.3 sq m

\*\* For ceiling heights above 35 ft/10.7m, up to 45ft/13.7m, if using the 12 sprinklers for 50psi/345kPa discharge pressure design criteria, Hose Demand requirement is 500gpm/1893lpm for 90 minutes.

Data based upon FM Global Loss Prevention Data Sheet 8-9

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 I - IV 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.

**Commodity Hazards Other Than Class I- IV 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 (K160) upright CMSA sprinkler. Base the design for the K25.2 (K360) upright sprinkler using the same design required for the K11.2 (K160) sprinkler, however base the required pressure using the following chart.

Commodities other than Class I-IV and Cartoned Plastics	
Design Pressure of K11.2 (K160) CMSA Standard Response Upright Sprinkler*	Corresponding Design Pressure of LP-46 K25.2 (K360) Standard Response Upright Sprinkler*
psi/kPa	psi/kPa
Up to 25/170	7/48
Over 25/170 up to 50/350	10/69
Over 50/350 up to 75/520	10/69

\* One sprinkler for every 100 sq. ft/9.29 sq. m

Data based upon FM Global Loss Prevention Data Sheet 8-9

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### SYSTEM DESIGN AND LISTING REQUIREMENTS PER FM GLOBAL



**Shape of Operating Area:** This sprinkler is not permitted in buildings having a ceiling slope over 10° unless the ceiling sprinkler is supplemented with in-rack sprinkler protection. Base the number of sprinklers in the Operating Area parallel to the branchline based on the following equation:

$$\text{Number of AS in operating area parallel to branchline} = (\text{shape factor} / \text{on-line AS spacing}) \times (\text{Number of AS} \times \text{area spacing of sprinklers})^{0.5}$$

The shape factor is 1.2 for slope less than or equal to 5°.

The shape factor is 1.4 for slope greater than 5° and up to 10°.

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).

**System Types:** 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 dry-pipe system or refrigerated area sprinkler systems are acceptable.

### SPRINKLER SPACING

Ceiling Height (Up To and Including)	Minimum Linear Distance Between Sprinklers	Maximum Linear Distance Between Sprinklers
30 ft/9.1m	8 ft/2.4m	12 ft/3.6m
	Minimum Area of Coverage	Maximum Area of Coverage
	80 ft²/ 7.43m²	100 ft²/ 9.29m²
above 30 ft/9.1m and up to 40 ft/12.3m	Minimum Linear Distance Between Sprinklers	Maximum Linear Distance Between Sprinklers
	8 ft/2.4m	10 ft/3m
	Minimum Area of Coverage	Maximum Area of Coverage
	80 ft²/ 7.43m²	100 ft²/ 9.29m²

**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

**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: 12"/305 mm

**Obstructions:** For more information, reference FM Data sheet 2-0.

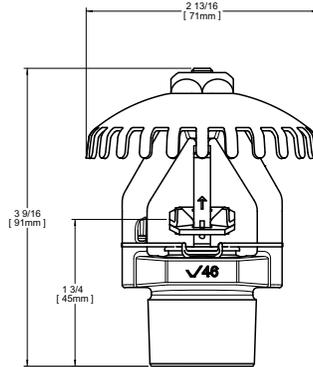
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**MODEL LP-46**

**DIMENSIONS**

**Standard Upright – LP-46 (SIN V4603)**



**AVAILABLE WRENCHES**

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

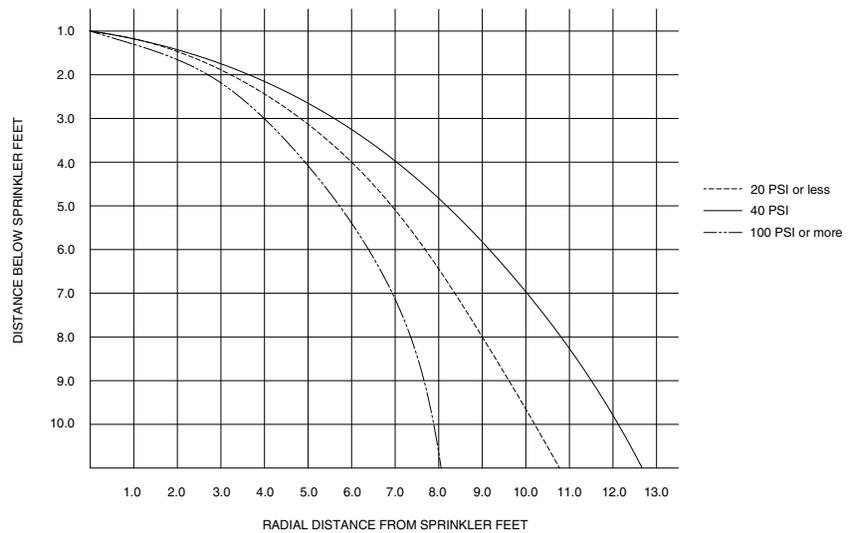
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## MODEL LP-46

### 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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**MODEL LP-46**

**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.

**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](http://www.victaulic.com)

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