

# Flame Arrester

## End-of-line, deflagration



### Model 310

## Product Description

Storagetech™'s Model 310 End of Line Deflagration Type Flame arresters are passive devices that prevent the propagation of a flame or fire from entering into an opening in a pipeline or vessel discharging flammable vapour.

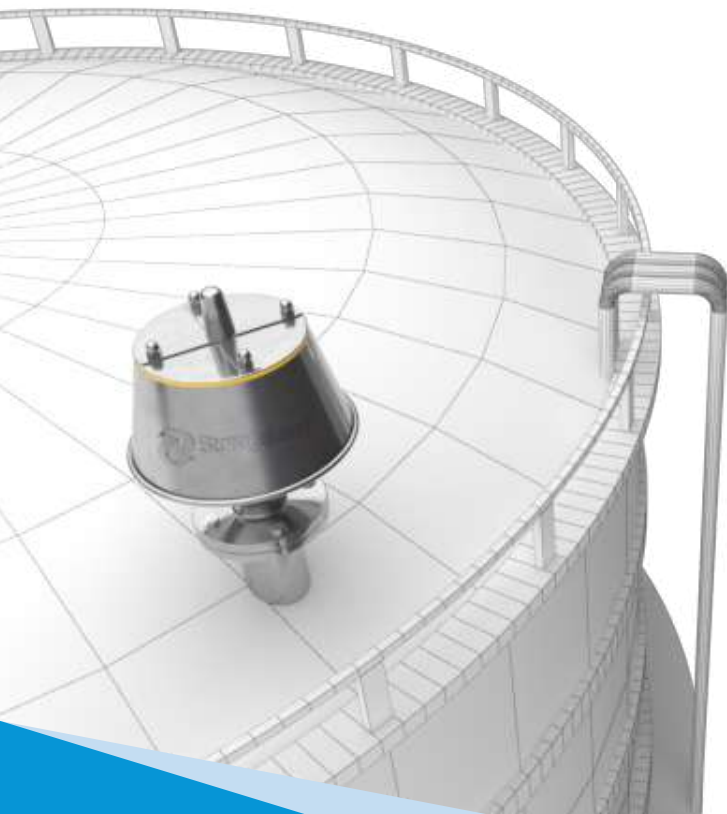
The flame cell, under normal operation, allows the free flow of vapour, although it does introduce some additional pressure-loss that must be considered in the design of the system. In a situation where a fire occurs external to the equipment and ignites the vapour, the flames will start to travel back through the system. The flame arrester will prevent the flame from entering the opening.

In addition, it allows free ventilation in combination with flame protection for vertical ventilation applications. The cell can be removed for cleaning or replacement.



StorageTech provides the high quality and reliable solutions for your needs with 40 years of experience.

Your investments will be much safer with Storagetech™ Flame Arrester solutions, which are completely produced in accordance with international norms.



Standard Sizes	2" to 8"
Body / Flanges	1- Carbon steel 2- Stainless steel AISI 316 -L or 304-L 3- Aluminium 4- Customer Specification
Flange Drilling	ANSI #150, PN16, and Special
Flame Element	Stainless steel AISI 304 -L or 316-L
Gasket	Nitrile, Viton, PTFE, Special
Screen	SS 304
Paint Finish	1- Powder Coating, Colour RAL 9006 2- Epoxy Paint, Colour RAL 9006 3- Customer Specification
ATEX Cert	Ex II 1/2 G IIA , G IIB

## End-Of-Line Flame Arrester, Deflagration

This deflagration flame arrester is suitable for quenching subsonic flames and should be located at the end of a pipeline or exit from a vessel.

It should be installed in the horizontal plane and is not for use with pressure relief valves or pressure-vacuum relief valves.

A weather hood and screen protect the vent and restricts dust, wind, rain, or insects from entering and degrading the efficacy of the product.

## Design & Manufacturing Specifications



The size of the vent will be calculated in accordance with API Standard 2000 - Venting Atmospheric and Low Pressure Storage Tanks or other international standards.

## Standard Compliance

In-Line Deflagration Flame Arresters has been type-tested to EN ISO 16852 and approved according to ATEX Directive 2014/34/EU.



## Key Features

- StorageTech™ PW Model 310 internal materials are AISI 304 or 316 stainless steel.
- Easy to clean internal materials.
- Easy to install. You do not need a special tool or experience to install the StorageTech Flame Arrester Model 310.
- StorageTech™ PVV Model 310 comes with the paint color you choose.
- Standard manufacturing comes with ANSI 150# flange; however other flange types are available on request.
- Protection cap is manufactured from aluminum material.

## Product Benefits

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The area of each passage determines level of protection that the element provides. StorageTech TM Model 310 Inline Deflagration Flame Arrester has a Maximum Experimental Safe Gap as per standard, and is suitable for gas groups IIB and IIA.

Flame arresters are usually designed for use at ambient temperature and pressure. Please consult StorageTech experienced and trained engineers for advice if other conditions are encountered. Higher temperatures and pressures put increased load on the flame arrester and testing under actual or simulated conditions may be required.

Regular inspection and maintenance of flame arresters is essential. If a flashback is known or believed to have occurred then the arrester should be inspected for damage. Small cells or components of the flame arrester are prone to dirt collection and clogging, leading to increased pressure drop. Damaged or dirty elements should be replaced. It is usually possible to clean the element for reuse. When properly maintained, a flame arrester can provide many years of service.

## Unconfined Deflagration

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Unconfined deflagration is caused by the ignition of a flammable gas outside a container or equipment. For example, vent gas from a gasoline tank can create a cloud of flammable vapor around it. A lit cigarette, static electricity or lightning can ignite this vapor and the resulting flame can return to the tank.

## Confined Deflagration

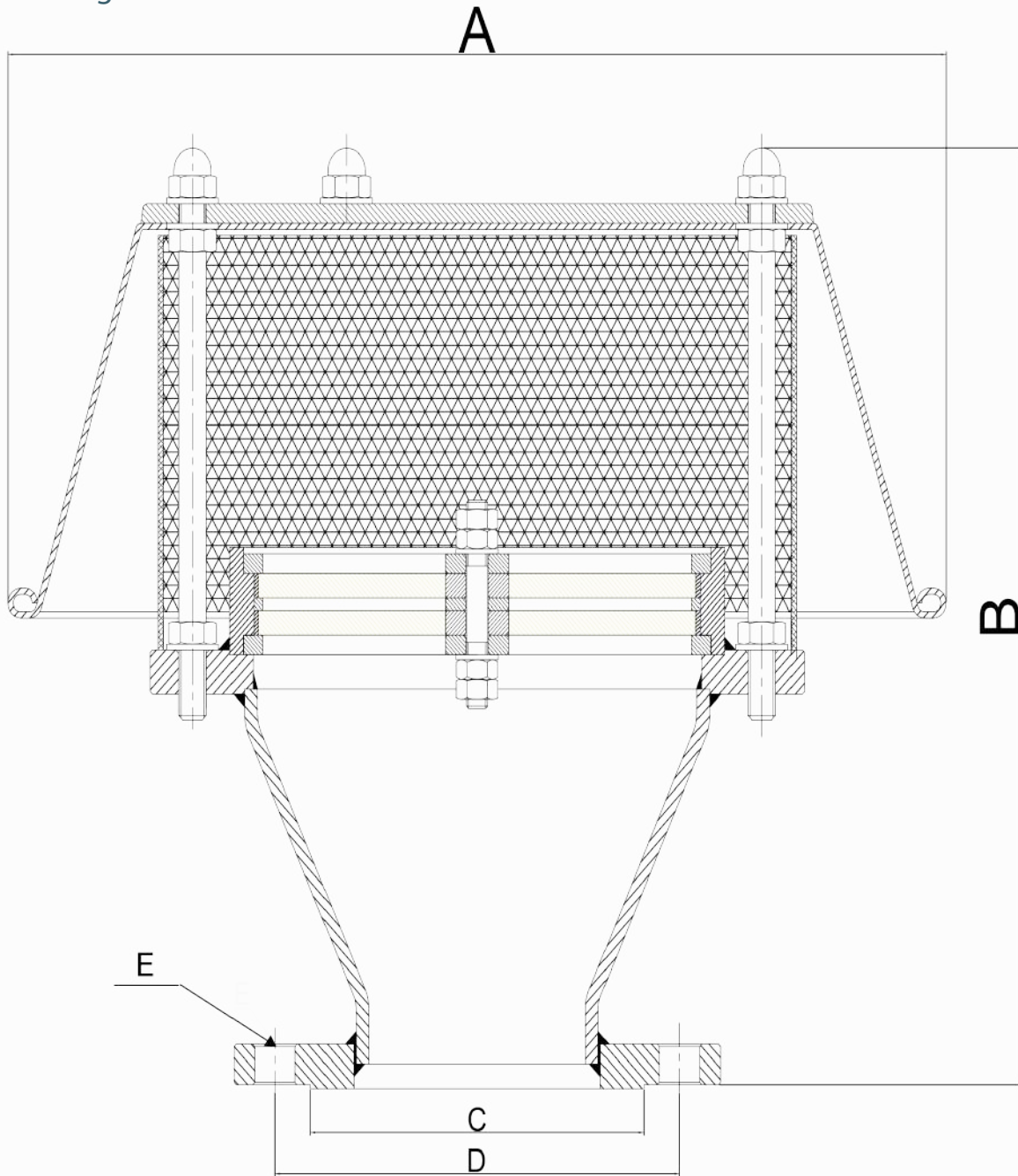
When a flammable mixture in a pipeline is ignited, the flame front initially travels along the pipe at subsonic speeds, a phenomenon called confined deflagration. For example, methane gas produced in underground coal mines is transported to the surface through a pipe and burned in a boiler.

However, a malfunction in the boiler or pumping system can ignite the gas in the pipe and the flame can travel along the pipe and explode the gas underground.



\* When removing, cleaning, and replacing element banks, it is vital that the installation, operation, and maintenance instructions (IOMs) provided by the manufacturer are strictly adhered to.

## Technical Drawing



## Weight & Dimensions

SIZE		A	B	C		D		E		TOTAL WEIGHT (kg)	
NPS	DN			ANSI 150# RF	PN 16	ANSI 150# RF	PN 16	ANSI 150# RF	PN 16	Steel	Aluminium
2"	50	130	250	92	102	120.5	125	Ø19x4	Ø18x4	10.3	3.46
3"	80	370	270	127	138	152.4	160	Ø19x4	Ø18x8	20.3	6.94
4"	100	370	340	157.2	158	190.5	180	Ø19x8	Ø18x8	29.5	10.46
6"	150	455	340	216	212	241.3	240	Ø22x8	Ø22x8	42.1	15.67
8"	200	640	430	270	268	298.4	295	Ø22x8	Ø22x12	49.6	21.54
10"	250	670	400	324	320	362	355	Ø25.4x12	Ø26x12	65.9	28.6
12"	300	920	460	381	378	431.8	410	Ø25.4x12	Ø26x12	82.73	34.2

<b>A</b>	•Element Diameter
A-H	•Element Height
<b>B</b>	•Element Housing Diameter
B-H	•Element Housing Height
<b>C</b>	•Element Holder Diameter
C-H	•Element Holder Height
<b>D</b>	•Spacer Diameter
D-H	•Spacer Height

MODEL	End-Of-Line Flame Arrester, With Automatic Opening Hood, Deflagration					
	SIZE	2"	3"	4"	6"	8"
<b>A</b>		100	150	200	250	400
A-H		10	10	10	10	10
<b>B</b>		150	200	250	300	450
B-H		90	90	90	100	100
<b>C</b>		150	200	250	300	450
C-H		10	10	10	20	20
<b>D</b>		100	150	200	250	400
D-H		6	6	6	6	6

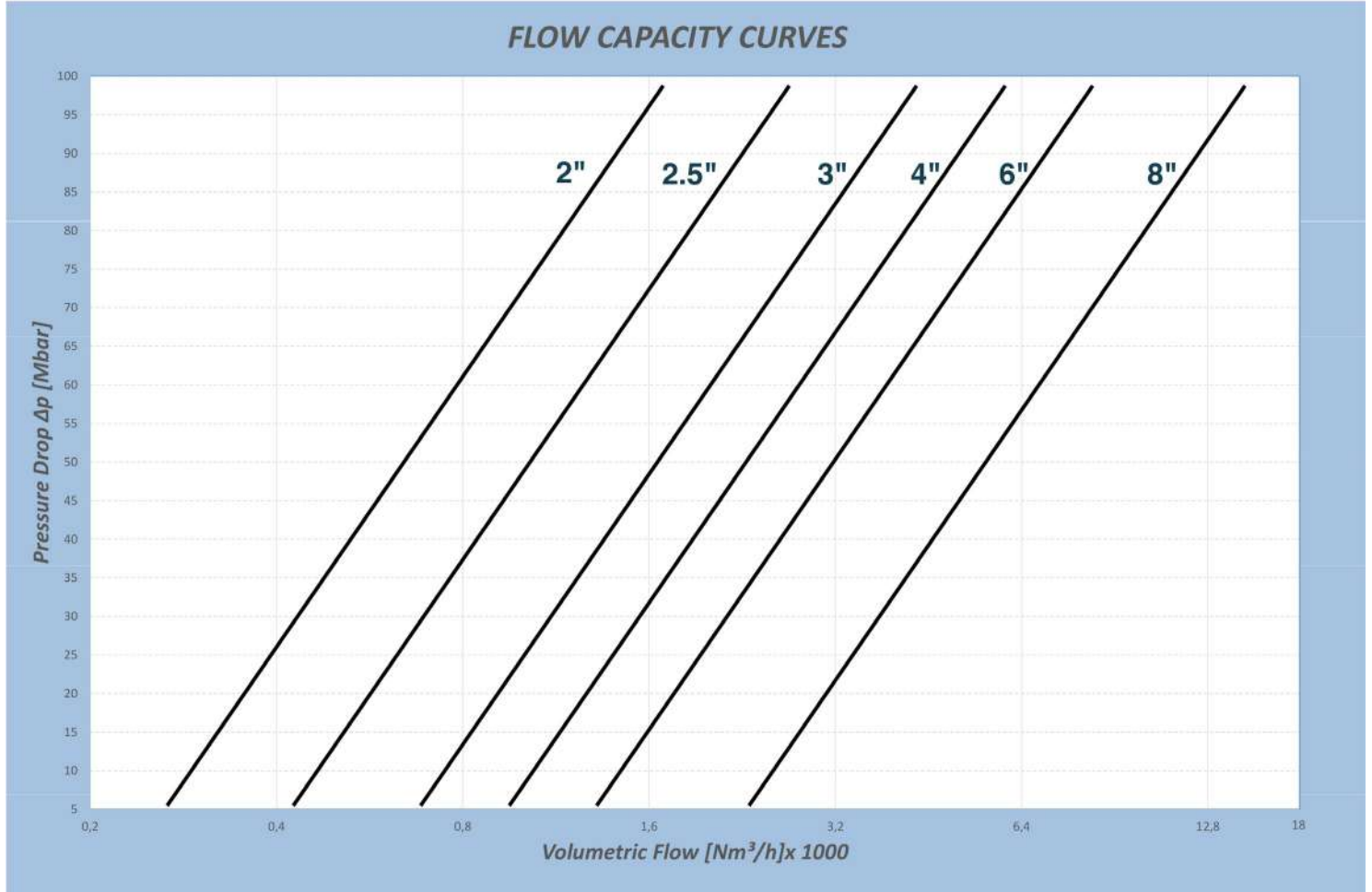
## Flow Capacity Tables

Pressure Drops (mbar)

Gas Group	Element	Pipe Size	Flow in Nm <sup>3</sup> /h Air																		
			5	10	15	20	30	40	50	60	70	80	90	100	150	200	300	400	500		
IIA/IIIB	100/10/50	DN50	2"	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	1.1	1.9	4.2	8.3	12.2	
	130/10/50	DN65	2.5"	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	1.8	3.2	4.9	
	150/10/50	DN80	3"	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.3	1.9	
	200/10/50	DN100	4"	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
	250/10/50	DN150	6"	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	400/10/50	DN200	8"	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Gas Group	Element	Pipe Size	Flow in Nm <sup>3</sup> /h Air																	
			600	700	800	900	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	12000	16000	18000	
IIA/IIIB	100/10/50	DN50	2"	18.6	25.3	33.2	42.1	52.3												
	130/10/50	DN65	2.5"	7.3	10.1	13.4	16.3	20.6	85.4											
	150/10/50	DN80	3"	2.7	3.8	4.9	6.2	7.5	30.8	71.6										
	200/10/50	DN100	4"	0.9	1.3	1.6	2	2.6	9.9	23.4	39.9	65.5								
	250/10/50	DN150	6"	0.5	0.7	0.9	1.2	1.5	6.1	13.9	24.8	38.6	56.4	78.8	102.4	131.4	163.6			
	400/10/50	DN200	8"	<0.5	<0.5	<0.5	<0.5	0.5	1.9	3.7	7.9	12.8	18.4	25.2	33.1	41.7	51.6	74.9	137.3	176.1

## Flow Capacity Curves



# Product Recommendations



## Flame Arrester

End-Of-Line,  
With Automatic  
Opening Hood,  
Deflagration

Model: 312

Storagetech™ Flame Arrestors ( End-of-line, with Automatic Opening Hood) are passive devices that prevent the propagation of a flame or fire from entering into an opening in a pipeline or vessel discharging flammable vapor. As different from model 310, Model 312 end of line flame arrester's weather hood is designed to react fire instantly tanks to it's fusible link, which is melted during the fire and let the weather hood release the gas/fire to the atmosphere.



## Pressure Vacuum Relief Valve With Flame Arrester

End-Of-Line,  
Weight Loaded,  
Combination,  
Atmospheric Deflagration  
Proof

Model: 330

Storagetech™s Model 330 Pressure Vacuum Relief Valve with Flame Arrester provides protection to bulk storage tanks and vessels from over and under pressurization.



## Flame Arrester

Vertical,  
In-Line,  
Detonation

Model: 320

Storagetech™s Model 320 In-line Detonation Flame Arrester (also called flame arrester or fire arrester) is designed for installation in gas pipelines. Detonation occurs when a flame travelling through the pipeline reaches supersonic velocities, usually as a result of the pipeline configuration or pipeline surface roughness. Changes in gas density and pressure causes the flame velocity to metamorphose from subsonic to supersonic.



## Flame Arrester

Horizontal,  
In-Line,  
Detonation

Model: 321

Storagetech™s Model 321 In-line Detonation Flame Arrester (also called flame arrester or fire arrester) is designed for installation in gas pipelines. Detonation occurs when a flame travelling through the pipeline reaches supersonic velocities, usually as a result of the pipeline configuration or pipeline surface roughness. Changes in gas density and pressure causes the flame velocity to metamorphose from subsonic to supersonic.

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### data sheet series

Flame Arrester  
End-of-line, deflagration

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