

# Pressure Vacuum Relief Valve with Flame Arrester

End-of-line, spring loaded, combination,  
atmospheric deflagration proof  
**Model 331**



## Product Description

The assembly of this pressure relief valve with an effective flame arrestor will enhance the safety of personnel, site location, and equipment, by reducing or eliminating the risk of flash over through the vent.

It will be useful to look at more detailed catalogs for the Model 300 and Model 101 to examine the technical specifications, performance data, application areas and other details of both models.

## The Unit Will Comprise

Model 300	Flame Arrestor - Vertical,in-line,deflagration
Model 320	Flame Arrestor - Vertical,in-line,detonation
Model 100	Pressure Vacuum Relief Valve (Weight Loaded, End-of-Line)
Model 101	Pressure Vacuum Relief Valve (Spring Loaded, End-of-Line)
Model 120	Pressure Vacuum Relief Valve (Top Mounted, Pipe Away, Weight Loaded)
Model 121	Pressure Relief Valve (Top Mounted, Pipe Away, Spring Loaded)

## Additional Information

Data Sheet	Pressure Relief, Vacuum Relief, and Pressure-Vacuum Relief Valves
Data Sheet	Model 300 In-line Deflagration Flame Arrestor
Data Sheet	Model 101 Pressure-vacuum Relief Valve (Spring-loaded; discharge to atmosphere)



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 Arrestor solutions, which are completely produced in accordance with international norms

## Product Benefits

Storagetech's Model 331 Pressure Vacuum Relief Valve with Flame Arrestor provides protection to bulk storage tanks and vessels from over and under-pressurization.

The valves are mounted on the tank roof flange or a vent pipe from the vapour space. In the closed position the pressure relief pallet and diaphragm assembly are held tightly against a seal to prevent the loss of vapour to the atmosphere.

As the internal pressure in the tank increases, due to product filling and vapour development, the pressure in the tank increases, and in the event that the set pressure of the unit is reached, the diaphragm will open and discharge the gas into the atmosphere.

The opening set-point is select able from a range between +61 mbar and +1000 mbar (+24 inch W.C. and 400 inch W.C.), and the valve will reseal when the tank returns to a safe pressure.

An in-line flame arrestor combination provides extra safety and avoids flame entrance inside the storage tank or pipe through valve openings. The flame arrestor can be unbolted and removed easily for maintenance purposes without affecting the pressure vacuum relief valve function.



\* 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.



<b>Standard Sizes</b>	2" to 16"(IIA) / 2" to 12"( IIB)
<b>Body / Flanges</b>	1- Carbon steel 2- Stainless steel AISI 304 -L or 316-L 3- Aluminium 4- Customer Specification
<b>Flange Drilling</b>	ANSI #150, PN16, and Special
<b>Flame Element</b>	Stainless steel AISI 304 -L or 316-L
<b>O-ring Seal</b>	Nitrile, Viton, Special
<b>Screen</b>	SS 304
<b>Paint Finish</b>	1- Powder Coating, Colour RAL 9006 2- Epoxy Paint, Colour RAL 9006 3- Customer Specification
<b>ATEX Cert</b>	Ex II 1/2 G IIA , G IIB

## Pressure Vacuum Relief Valve with Flame Arrester

It is suitable for use with any of StorageTech™ Pressure Relief, and Pressure-Vacuum Valves, and should be installed on the inlet to the Pressure Relief unit.

StorageTech™ Flame Arrester Model 331 provides safety. It blocks the flame and does not allow flame travel through a pipeline or any in outlet. Protect s environment. Flame arrester prevents your facility against fire that is caused by explosions. Controls the internal pressure of a storage tank or a container.

Flame arresters are designed to inhibit flame propagation in gas piping systems and to protect low pressure tanks containing flammable liquids. Arresters protect low flash point liquids from external sources of heat and ignition, increasing fire protection and safety.

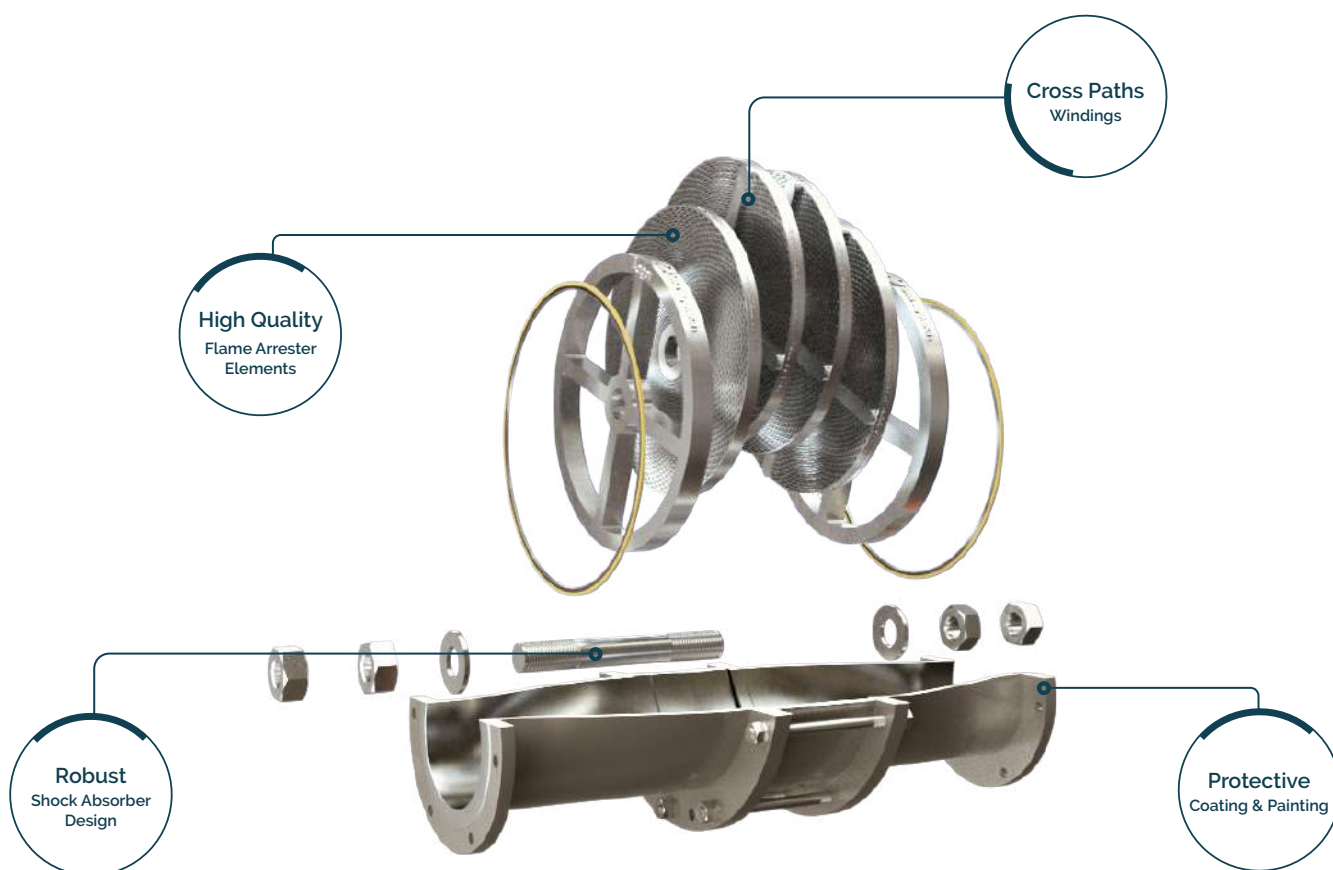
## Design & Manufacturing Specifications



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 301 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 with pressure vacuum relief valve.
- StorageTech™ PVV Model 101 and model 300 Flame Arresters come with the paint color you choose.
- Standard manufacturing comes with ANSI 150# flange; however other flange types are available on request.
- Also available with cap that is used to protect the flame arrester against dust and rain.

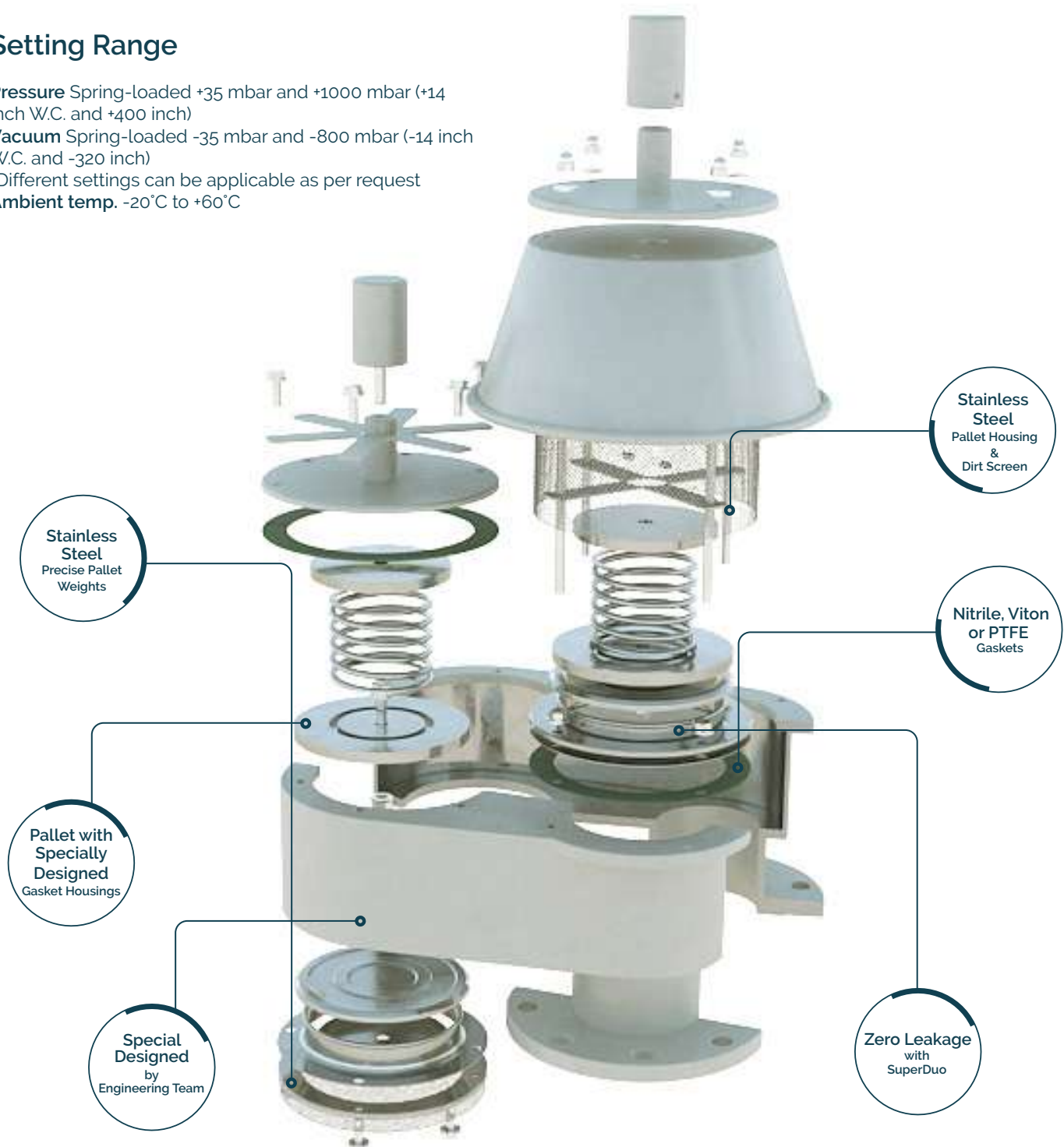
## Setting Range

**Pressure** Spring-loaded +35 mbar and +1000 mbar (+14 inch W.C. and +400 inch)

**Vacuum** Spring-loaded -35 mbar and -800 mbar (-14 inch W.C. and -320 inch)

\*Different settings can be applicable as per request

**Ambient temp.** -20°C to +60°C



## Key Features

- Easy to install. Do not need a special tool or experience.
- Light weight construction.
- Quick and easy to install, inspect and clean.
- Any grade materials are available.
- Has stainless steel pallets.
- Large weatherhood provides maximum airflow.
- Internal materials are resistant to winter conditions.
- Special designs can be achievable upon request to meet individual specifications.
- Vacuum and relief cases can be managed effectively as per the set requirements of bulk storage tank.

- Super Duo technology provides extra curves and perfect seating with zero leakage.
- Set values can be arranged as per the site conditions, no need supervising.
- Diaphragm is manufactured from PTFE material to prevent possibility of ice formation and sticky residues hindering the valve from opening, while the pallet assembly moves freely on guide posts.
- Design, manufacturing and test according to EN ISO 80079-36.
- Breathing requirements are fulfilled according to API 2000 7th Edition.
- PTFE, XYLAN, Rubber lining, etc. coating options are available.



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

MODEL	IIA DEFLAGRATION - MODEL 331								
SIZE	2"	3"	4"	6"	8"	10"	12"	14"	16"
<b>A</b>	100	150	200	250	300	500	600	700	800
<b>A-H</b>	10	10	10	10	10	15	15	15	15
<b>B</b>	100	200	250	280	350	550	700	800	900
<b>B-H</b>	90	90	90	100	100	200	200	200	200
<b>C</b>	100	150	200	250	300	500	600	700	800
<b>C-H</b>	10	10	10	20	20	20	20	20	20
<b>D</b>	100	150	200	250	300	500	600	700	800
<b>D-H</b>	6	6	6	6	6	6	6	6	6

MODEL	IIB DEFLAGRATION - MODEL 331						
SIZE	2"	3"	4"	6"	8"	10"	12"
<b>A</b>	100	200	250	300	400	500	600
<b>A-H</b>	30	30	30	30	30	30	30
<b>B</b>	150	250	300	350	450	550	700
<b>B-H</b>	131	151	151	212	232	232	232
<b>C</b>	100	200	250	300	400	500	600
<b>C-H</b>	18	28	28	28	38	38	38

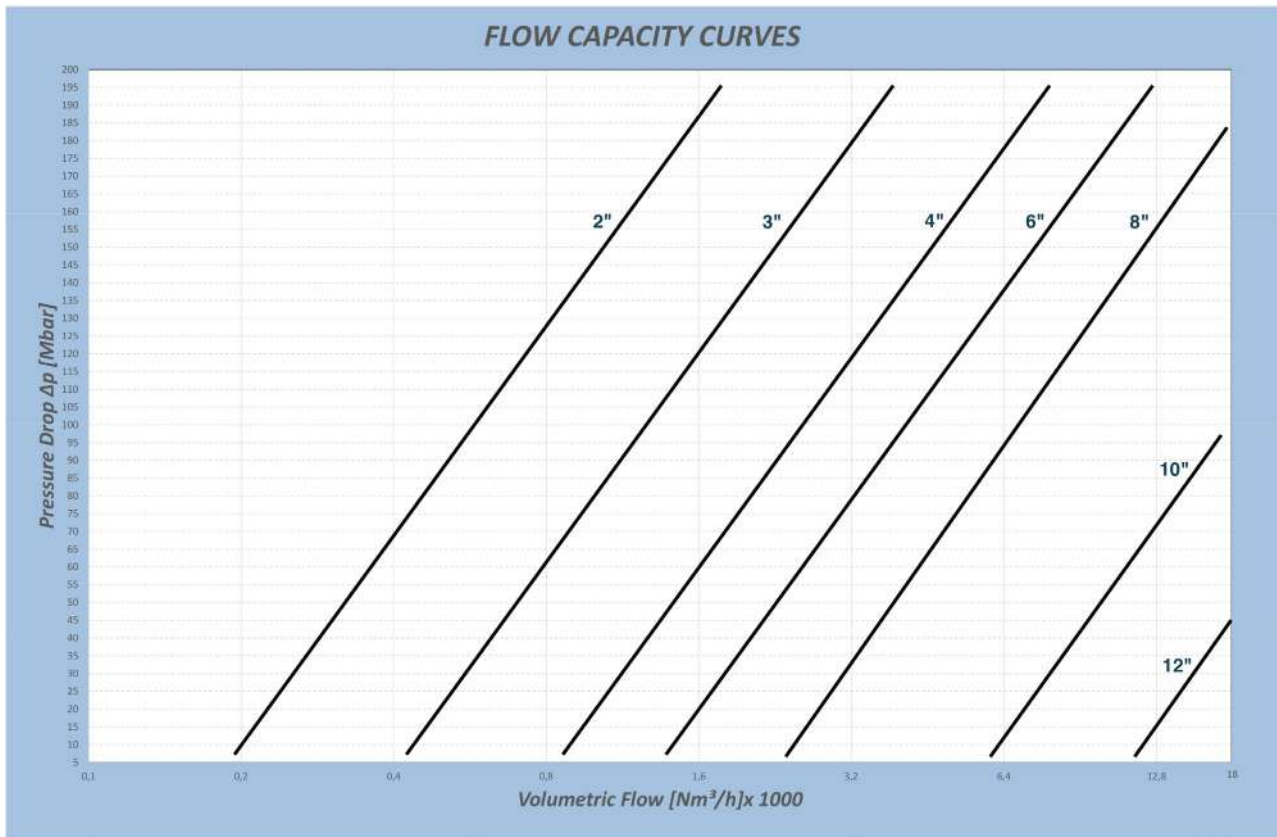
## Flow Capacity Tables

Pressure Drops (mbar)

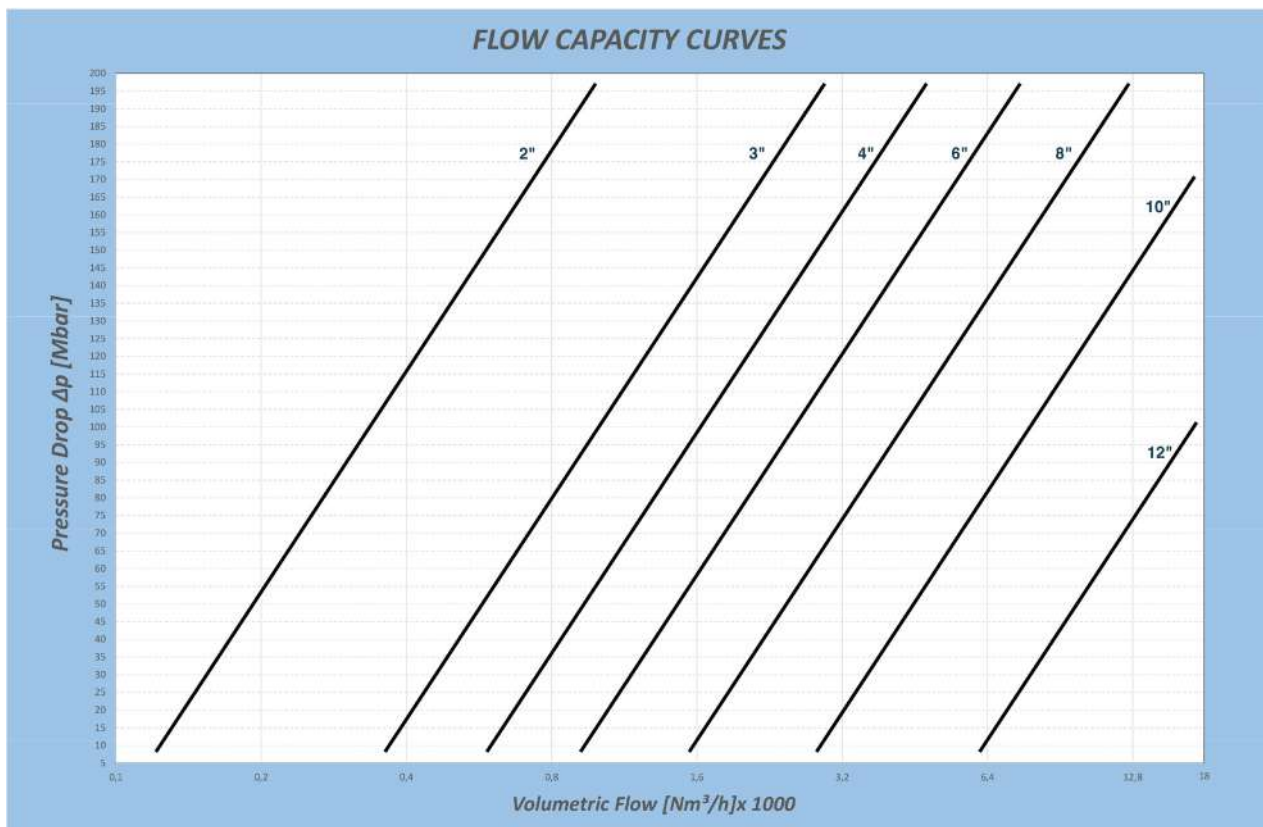
				Flow in Nm <sup>3</sup> /h Air																
Gas Group	Element	Pipe Size		5	10	15	20	30	40	50	60	70	80	90	100	150	200	300	400	500
<b>IIA</b>	100/10/54	DN50	2"	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	0.9	2.2	3.8	8.8	15.6	26.2
	150/10/54	DN80	3"	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	0.8	1.7	2.6	4.8
	200/10/54	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	0.7	1.3
	250/10/54	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
	300/10/54	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
	500/15/54	DN250	10"	<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
	600/15/54	DN300	12"	<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
<b>IIB</b>	100/30/35	DN50	2"	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	1.1	1.4	1.8	2.3	5.1	9.2	20.3	36.8	58.2
	200/30/35	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	1.1	2.8	5.2	7.4
	250/30/35	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	0.9	1.9	3.2
	300/30/35	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	0.7	1.2
	400/30/35	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
	500/30/35	DN250	10"	<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
	600/30/35	DN300	12"	<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

				Flow in Nm <sup>3</sup> /h Air																
Gas Group	Element	Pipe Size		600	700	800	900	1000	2000	3000	4000	5000	6000	7000	8000	9000	10000	12000	16000	18000
<b>IIA</b>	100/10/54	DN50	2"	39.3	51.2	68.5	85.2	106.8												
	150/10/54	DN80	3"	7.1	9.2	12.2	15.9	19.2	76.3	189.4										
	200/10/54	DN100	4"	1.6	2.9	3.4	4.1	5.2	20.9	48.3	86.5	139.2								
	250/10/54	DN150	6"	0.7	0.9	1.2	1.5	2.2	7.1	16.8	30.1	45.8	76.9	93.2	123.5	157.1	197.3			
	300/10/54	DN200	8"	<0.5	<0.5	0.5	0.8	1.1	3.9	9.2	15.5	25.1	36.3	49.7	65.2	83.3	103.5	151.4		
	500/15/54	DN250	10"	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	1.9	2.7	5.3	7.4	9.2	12.5	15.3	19.2	27.8	49.4	63.8
	600/15/54	DN300	12"	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	1.4	2.3	3.4	4.9	6.2	7.1	8.7	13.2	24.4	30.2
<b>IIB</b>	100/10/54	DN50	2"	83.7	115.3	151.5	195.4	245.6												
	150/10/54	DN80	3"	10.1	14.2	18.8	23.2	29.5	118.2											
	200/10/54	DN100	4"	3.9	5.1	7.2	8.8	11.3	45.5	103.2	188.4									
	300/30/35	DN150	6"	1.6	2.3	3.3	4.1	5.4	20.1	45.2	80.3	128.5	187.6							
	400/30/35	DN200	8"	<0.5	0.7	1.3	1.6	2.3	8.2	17.4	30.8	49.3	71.3	97.6	128.2	165.3	206.4			
	500/30/35	DN250	10"	<0.5	<0.5	<0.5	<0.5	0.6	2.8	6.2	11.3	17.5	24.3	32.7	42.6	55.5	68.1	99.3	181.9	234.2
	600/30/35	DN300	12"	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	3.2	4.7	8.2	11.3	15.4	20.3	25.5	31.1	45.2	81.6	104.3

## Technical Drawing



In Line Def. 2A



In Line Def. 2B

# Product Recommendations

Storagetech™ manufactures storage tank equipment, such as flame arresters, breather valves, gauge hatches, floating roofs, and floating suction pipe.



## Flame Arrestor

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 arrestor'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.



## Flame Arrestor

Horizontal,  
In-Line,  
Detonation

Model: 321

Storagetech™'s Model 321 In-line Detonation Flame Arrestor (also called flame arrestor or fire arrestor) 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 Arrestor

Vertical,  
In-Line,  
Detonation

Model: 320

Storagetech™'s Model 320 In-line Detonation Flame Arrestor (also called flame arrestor or fire arrestor) 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 Arrestor

Vertical,  
In-Line,  
Deflagration

Model: 300

Storagetech™'s Model 300 Vertical In-line Deflagration Flame Arrestor (also called flame arrestor or fire arrestor) is intended for pipeline installation close to the source of any potential ignition source by minimising flame speed and the development of an explosive pressure.

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### data sheet series

PVRV with FA - E.O.L., S.L.,  
comb., atmospheric def. proof

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