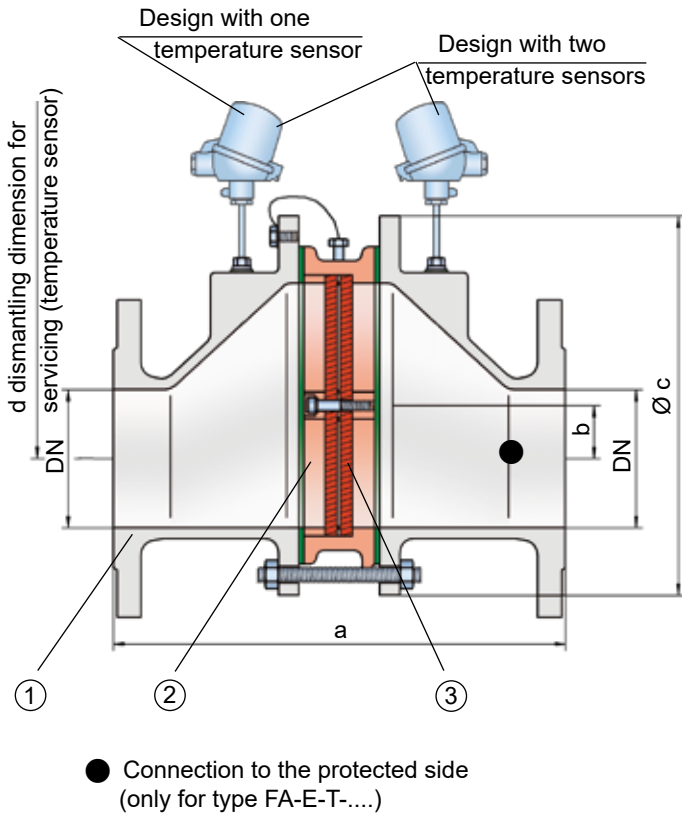


## In-Line Deflagration Flame Arrester

eccentric design,  
bi-directional

**PROTEGO® FA-E**



### Function and Description

The PROTEGO® FA-E series of in-line deflagration flame arresters is designed with an eccentric housing to automatically drain condensate build up in the housing. Due to its eccentric design, the device can be installed in pipelines that run close to floors or walls and low points to prevent the build-up of condensate. When installing the deflagration flame arrester, make sure that the distance between potential ignition sources and the location of the installed device does not exceed the L/D ratio (pipe length/pipe diameter) for which the device was approved. According to EN ISO 16852, the installation limits are  $(L/D)_{max} \leq 50$  for deflagration flame arresters of explosion groups IIA and IIB3 (NEC groups D to C) and  $(L/D)_{max} \leq 30$  for explosion group IIC (NEC group B).

The devices are symmetrical and offer bi-directional flame transmission protection. The arrester essentially consists of two housing parts (1) and a PROTEGO® flame arrester unit (2) in the center. The PROTEGO® flame arrester unit is modular and consists of several FLAMEFILTER® discs (3) and spacers firmly held in a FLAMEFILTER® casing. The number of FLAMEFILTER® and their gap size depends on the device's intended use.

Specifying the operating conditions, such as the temperature, pressure, explosion group, and the composition of the fluid, enables PROTEGO® to select the best deflagration flame arrester for your application. The PROTEGO® FA-E series of deflagration flame arresters is available for substances from explosion groups IIA to IIC (NEC groups D to B).

The standard design can be used at an operating temperature of up to +60°C / 140°F and an absolute operating pressure up to 1.1 bar / 15.9 psi. **Devices with special approval for higher pressures (see table 3) and higher temperatures are available upon request.**

Type-approved in accordance with the current ATEX Directive and EN ISO 16852, as well as other international standards.

### Special Features and Advantages

- eccentric design prevents condensate build up
- special design for elevated operating temperatures and pressures available
- modular design enables each individual FLAMEFILTER® to be replaced
- service friendly: FLAMEFILTER® can be cleaned easily
- eccentric design eases installation close to floors and walls
- bi-directional flame transmission proof design
- protects against deflagrations for all explosion groups IIA, IIB3 and IIC (NEC groups D, C and B)
- modular design reduces spare parts cost

### Design and Specifications

There are three different designs:

- |   |   |
|---|---|
| Basic in-line deflagration flame arrester   | <b>FA-E</b> - <input type="checkbox"/>    |
| In-line deflagration flame arrester with integrated temperature sensor* as additional protection against short-time burning from one side         | <b>FA-E</b> - <input type="checkbox"/> T  |
| In-line deflagration flame arrester with two integrated temperature sensors* for additional protection against short-time burning from both sides | <b>FA-E</b> - <input type="checkbox"/> TB |

Additional special devices available upon request

\*Resistance thermometer for device group II, category (1) 2 (GII cat. (1) 2)



Stabilized FLAMEFILTER®  
Discs (Flyer pdf)



New PROTEGO® Flame Arrester Unit with  
unique maintenance friendly design (Flyer pdf)



L/D ratio (Flyer pdf)

**Table 1: Dimensions**

Dimensions in mm / inches

To select the nominal size (DN), use the flow capacity charts on the following pages.

Expl. Gr.	DN	25 / 1"	32 / 1¼"	40 / 1½"	50 / 2"	65 / 2½"	80 / 3"	100 / 4"	125 / 5"	150 / 6"	200 / 8"	250 / 10"	300 / 12"
IIA	a	304 / 11.97	304 / 11.97	310 / 12.20	314 / 12.36	360 / 14.17	364 / 14.33	370 / 14.57	434 / 17.09	440 / 17.32	450 / 17.72	480 / 18.90	500 / 19.69
IIB3	a	304 / 11.97	304 / 11.97	310 / 12.20	314 / 12.36	360 / 14.17	364 / 14.33	370 / 14.57	434 / 17.09	440 / 17.32	450 / 17.72	480 / 18.90	500 / 19.69
IIC	a	304 / 11.97	304 / 11.97	321 / 12.64	325 / 12.80	371 / 14.61	375 / 14.76	381 / 15.00	445 / 17.52	451 / 17.76	461 / 18.15	491 / 19.33	511 / 20.12
	b	29 / 1.14	29 / 1.14	29 / 1.14	29 / 1.14	38 / 1.49	38 / 1.49	39 / 1.53	65 / 2.56	65 / 2.56	55 / 2.17	58 / 2.28	60 / 2.36
	c	185 / 7.28	185 / 7.28	210 / 8.27	210 / 8.27	250 / 9.84	250 / 9.84	275 / 10.83	385 / 15.16	385 / 15.16	450 / 17.72	500 / 19.69	575 / 22.64
	d	400 / 15.75	400 / 15.75	410 / 16.14	410 / 16.14	440 / 17.32	440 / 17.32	460 / 18.11	520 / 20.47	520 / 20.47	540 / 21.26	570 / 22.44	600 / 23.62

**Table 2: Selection of the explosion group**

MESG	Expl. Gr. (IEC/CEN)	Gas Group (NEC)	Special approvals upon request.
> 0.90 mm	IIA	D	
≥ 0.65 mm	IIB3	C	
< 0.50 mm (> 0.50 mm)	IIC (IIB)	B	

**Table 3: Selection of max. operating pressure**

Expl. Gr.	DN	25 / 1"	32 / 1¼"	40 / 1½"	50 / 2"	65 / 2½"	80 / 3"	100 / 4"	125 / 5"	150 / 6"	200 / 8"	250 / 10"	300 / 12"
IIA	P <sub>max</sub>	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2
IIB3	P <sub>max</sub>	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2
IIC	P <sub>max</sub>	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.2 / 17.4	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9

P<sub>max</sub> = maximum allowable operating pressure in bar / psi absolute, higher operating pressure upon request.

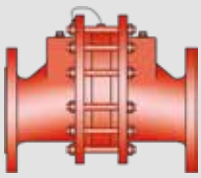
**Table 4: Specification of max. operating temperature**

≤ 60°C / 140°F	Tmaximum allowable operating temperature in °C	Higher operating temperatures upon request.
-	Classification	

**Table 5: Material selection for housing**

Design	B	C	D	The housing can also be delivered in carbon steel with an ECTFE coating. Special materials upon request.
Housing	Steel	Stainless Steel	Hastelloy	
Gasket	PTFE	PTFE	PTFE	
Flame arrester unit	A,C	C	D	





## In-Line Deflagration Flame Arrester

eccentric design,  
bi-directional

**PROTEGO® FA-E**

**Table 6: Material combinations of the flame arrester unit**

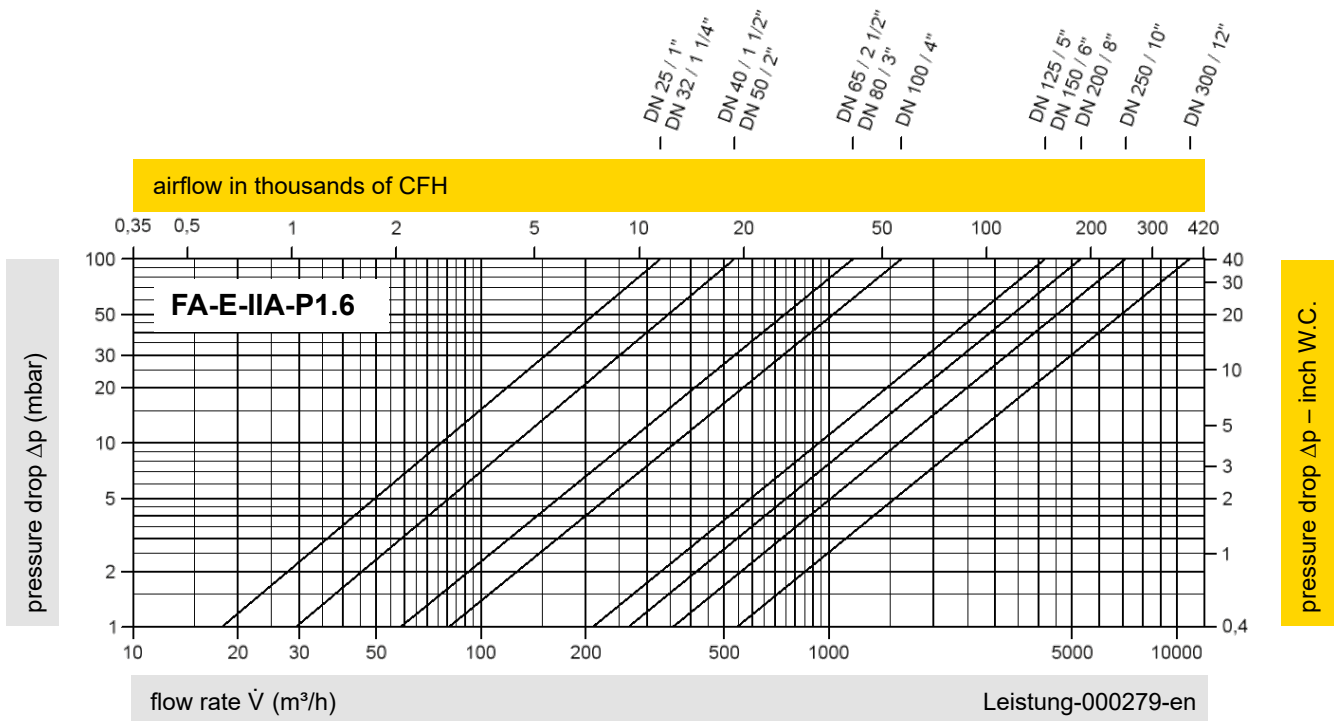
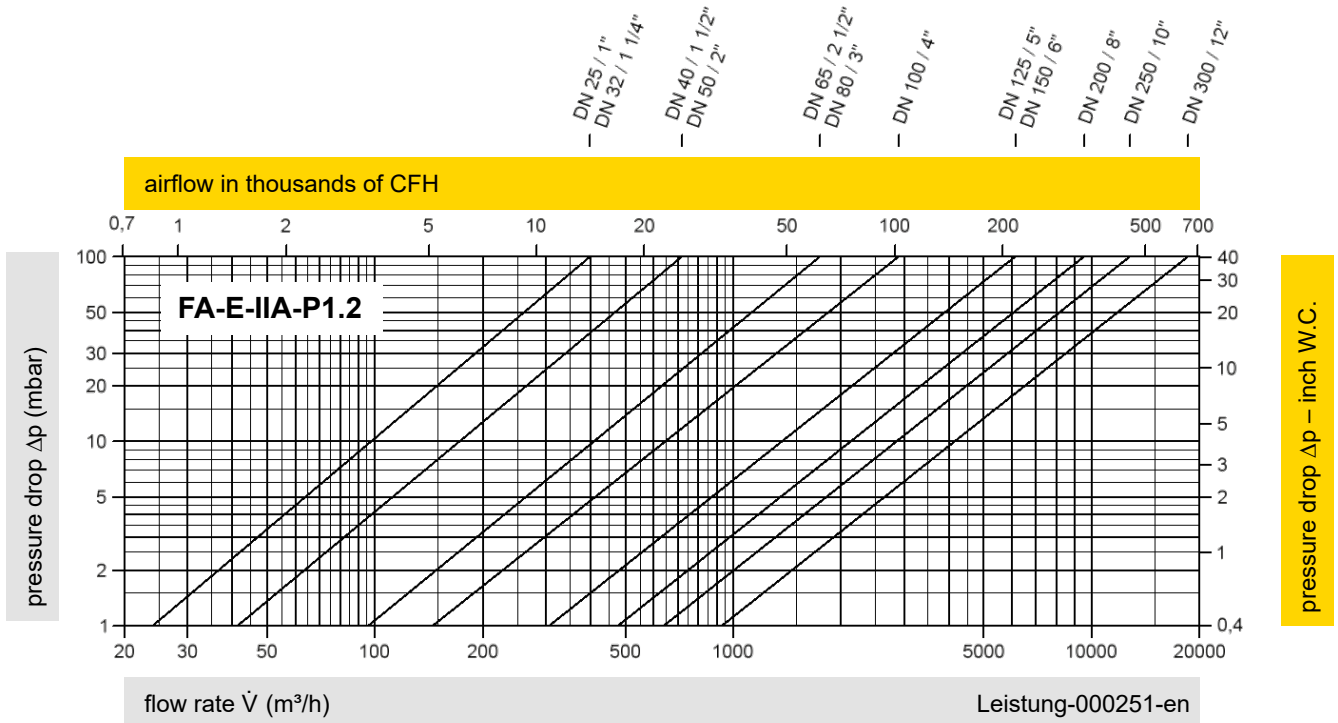
Design	A	C	D
FLAMEFILTER® casing	Steel	Stainless Steel	Hastelloy
FLAMEFILTER® *	Stainless Steel	Stainless Steel	Hastelloy
Spacers	Stainless Steel	Stainless Steel	Hastelloy

\*the FLAMEFILTER® is also available in Tantalum, Inconel, Copper, etc., when the listed housing and casing materials are used.  
Special materials upon request.

**Table 7: Flange connection type**

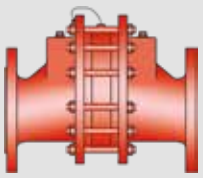
EN 1092-1; Form B1  
ASME B16.5 CL 150 R.F.

Other types upon request.



The flow capacity charts have been determined with a calibrated and TÜV certified flow capacity test rig. Volume flow  $\dot{V}$  in (m<sup>3</sup>/h) and CFH refer to the standard reference conditions of air in ISO 6358 (20°C, 1bar). For conversion to other densities and temperatures, refer to Sec. 1: "Technical Fundamentals."

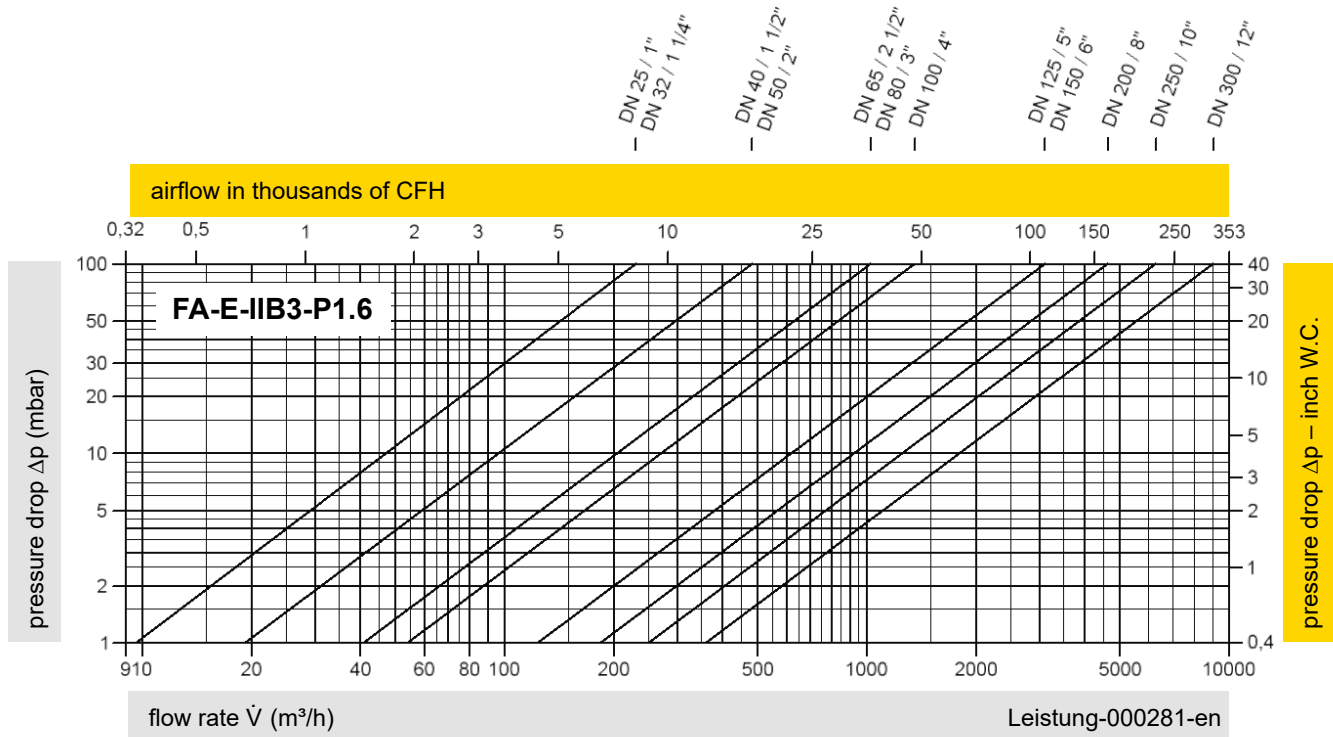
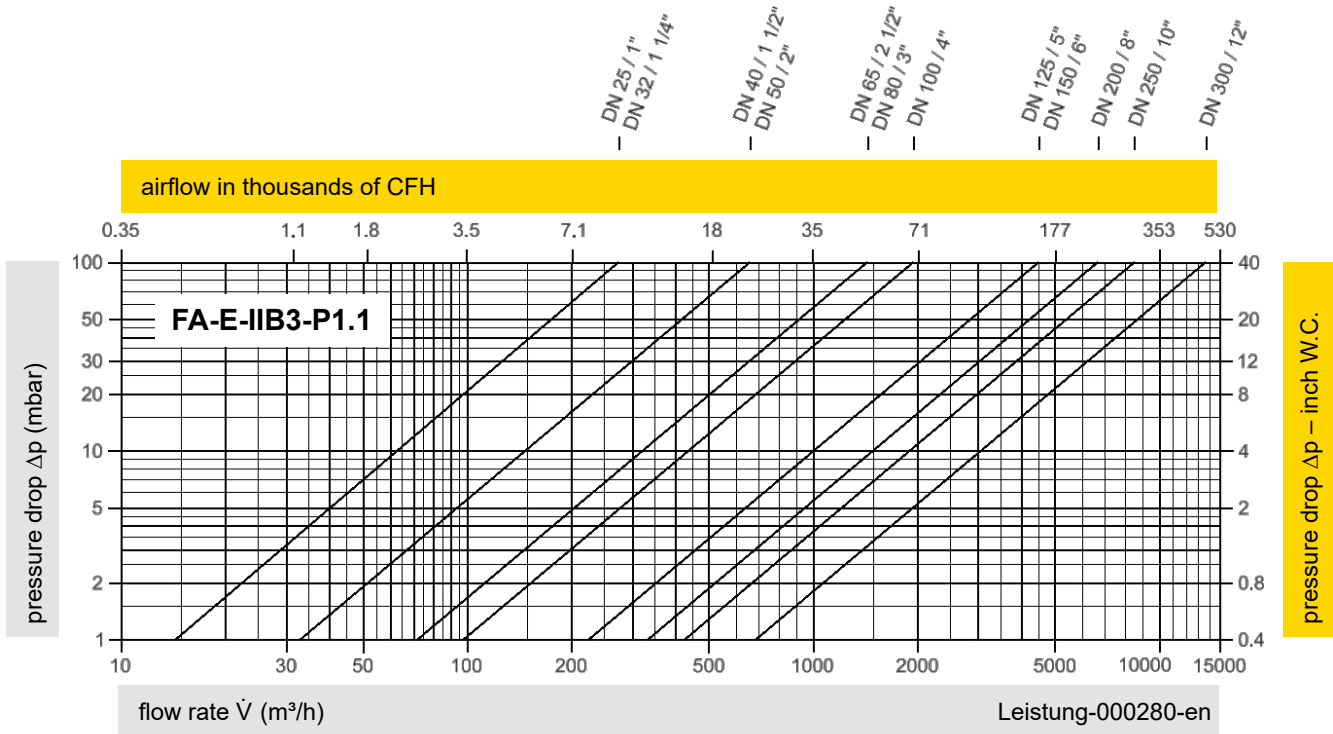




# In-Line Deflagration Flame Arrester

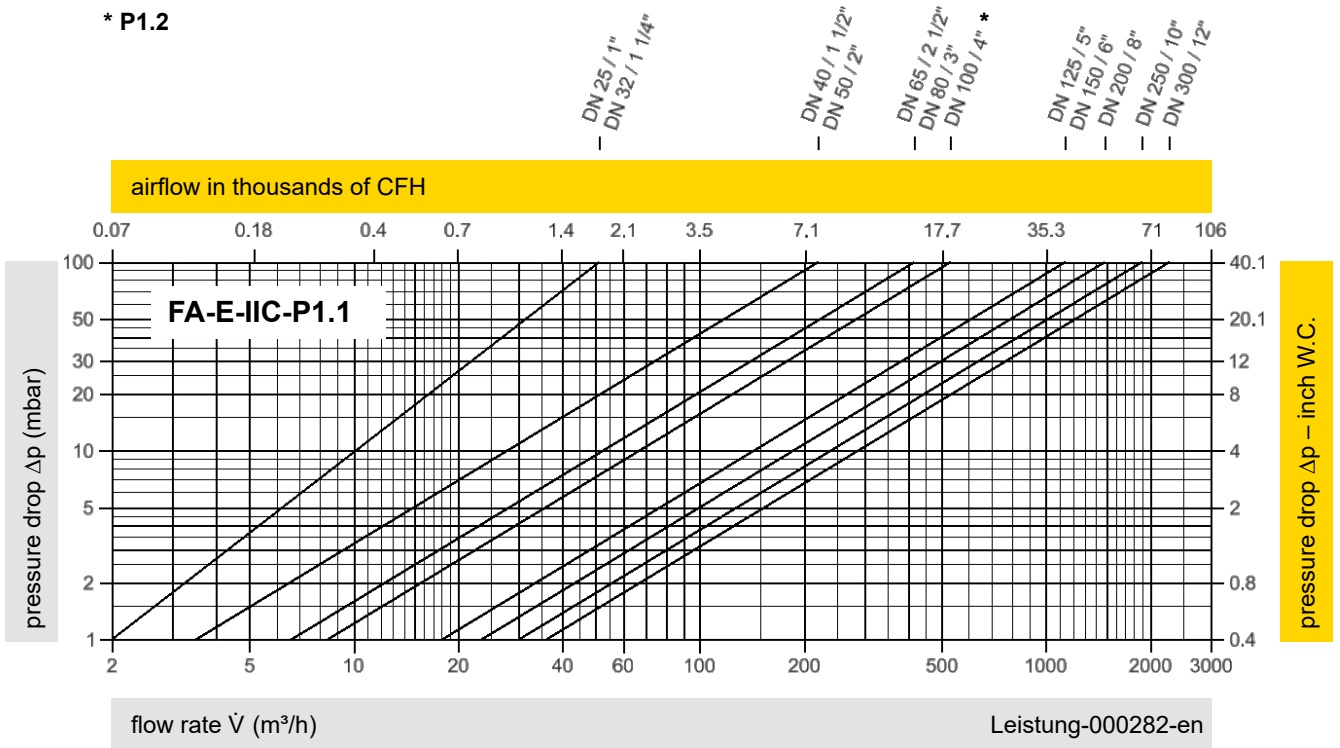
## Flow Capacity Charts

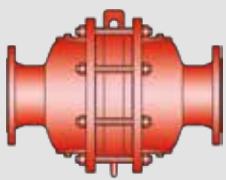
### PROTEGO® FA-E



The flow capacity charts have been determined with a calibrated and TÜV certified flow capacity test rig.  
 Volume flow  $\dot{V}$  in (m³/h) and CFH refer to the standard reference conditions of air in ISO 6358 (20°C, 1bar).  
 For conversion to other densities and temperatures, refer to Sec. 1: "Technical Fundamentals."

\* P1.2

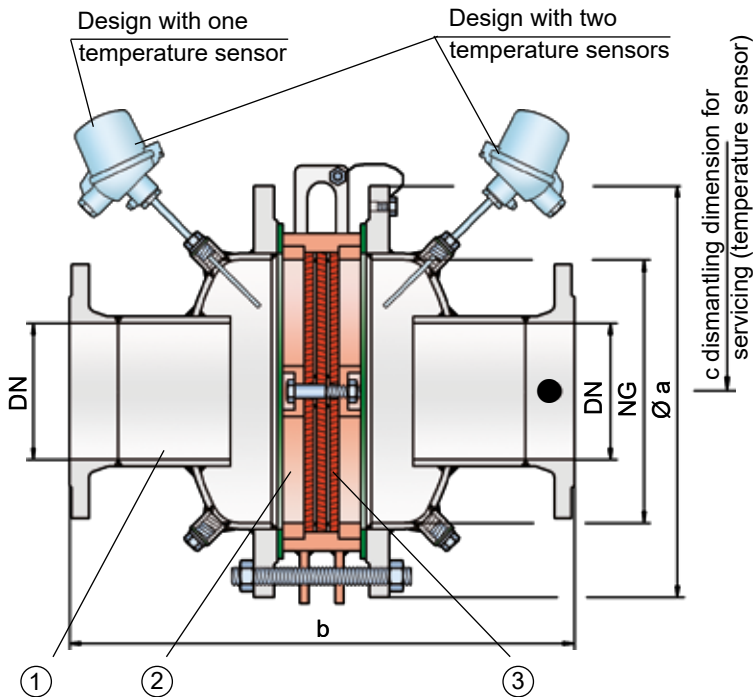




## In-Line Deflagration Flame Arrester

concentric design,  
bi-directional

**PROTEGO® FA-I**



● Connection to the protected side  
(only for type FA-I-T-....)

### Function and Description

In the development of the PROTEGO® FA-I in-line deflagration flame arrester, special effort was made to optimize the fluid dynamic flow characteristics. For a given flange connection size of the flame arrester, the FLAMEFILTER® size can be chosen for the most adequate flow capacity. When installing the deflagration flame arrester, make sure that the distance between potential ignition sources and location of the installed device does not exceed the L/D ratio (pipe length/pipe diameter) for which the device was tested (see table 4).

The deflagration flame arrester is symmetrical and offers bi-directional flame transmission protection. The device essentially consists of two housing parts (1) and the PROTEGO® flame arrester unit (2) in the center. The PROTEGO® flame arrester unit is modular and consists of several FLAMEFILTER® discs (3) and spacers firmly held in a FLAMEFILTER® casing. The number of FLAMEFILTER® discs and their gap size depends on the arrester's intended use.

Specifying the operating conditions, such as the temperature, pressure, explosion group, and the composition of the fluid, enables PROTEGO® to select the best deflagration flame arrester for your application. The PROTEGO® FA-I series of deflagration flame arresters is available for substances of explosion groups IIA and IIB3 (NEC groups D and C ((MESG ≥ 0.65 mm)).

The standard design can be used with an operating temperature of up to +60°C/ 140°F and an absolute operating pressure up to 1.1 bar / 15.9 psi. Devices with special approvals for higher pressures (see table 3) and higher temperatures are available upon request.

Type-approved in accordance with the current ATEX Directive and EN ISO 16852, as well as other international standards

### Special Features and Advantages

- optimized flow capacity
- different series allow increase of FLAMEFILTER® size for given flange connection resulting in lower pressure drop across the device
- option for integrated cleaning nozzles can be provided
- modular flame arrester unit enables each individual FLAMEFILTER® to be replaced and cleaned
- bi-directional flame transmission proof design
- protects with deflagrations for explosion groups IIA and IIB3 (NEC groups D and C)
- design available for elevated operating temperatures and pressures
- available sizes from DN 50 / 2" to DN 1000 / 40"
- lowest pressure drop results in low operating and lifecycle costs
- modular design reduces spare parts cost
- use of stabilized FLAMEFILTER® discs is possible
- use of PROTEGO® flame arrester unit in unique maintenance friendly design reduces service cost

### Design and Specifications

There are three different designs:

Basic deflagration flame arrester design **FA-I-**

In-line deflagration flame arrester with integrated temperature sensor\* for additional protection against short-time burning from one side **FA-I-T**

In-line deflagration flame arrester with two integrated temperature sensors\* for additional protection against short-time burning from both sides **FA-I-TB**

Additional special devices available upon request

\*Resistance thermometer for device group II, category (1) 2 (GII cat. (1) 2)



Stabilized FLAMEFILTER®  
Discs (Flyer pdf)



New PROTEGO® Flame Arrester Unit with  
unique maintenance friendly design (Flyer pdf)

**Table 1: Dimensions**

Dimensions in mm / inches

To select nominal width/nominal size (NG/DN) combination, please use the flow capacity charts on the following pages.						Additional nominal width/nominal size (NG/DN) combinations with improved flow capacity upon request.							
standard													
NG	150 6"	150 6"	200 8"	300 12"	400 16"	500 20"	600 24"	800 32"	1000 40"	1200 48"	1400 56"	1600 64"	
DN	≤ 50 2"	80 3"	≤ 100 4"	≤ 150 6"	≤ 200 8"	≤ 250 10"	≤ 300 12"	≤ 400 16"	≤ 500 20"	≤ 600 24"	≤ 800 32"	≤ 800 32"	
a	285 / 11.22	285 / 11.22	340 / 13.39	445 / 17.52	565 / 22.24	670 / 26.38	780 / 30.71	975 / 38.39	1175 / 46.26	1405 / 55.31	1630 / 64.17	1830 / 72.05	
Expl. Gr.	IIA b*	364 / 14.33	364 / 14.33	452 / 17.79	584 / 22.99	638 / 25.12	688 / 27.09	800 / 31.50	900 / 35.43	1000 / 39.37	1100 / 43.31	1350 / 53.15	1450 / 57.09
	IIB3 b*	364 / 14.33	364 / 14.33	464 / 18.27	596 / 23.46	650 / 25.59	700 / 27.56	800 / 31.50	900 / 35.43	1000 / 39.37	1100 / 43.31	1350 / 53.15	1450 / 57.09
c	500 / 19.69	500 / 19.69	520 / 20.47	570 / 22.44	620 / 24.41	670 / 26.38	700 / 31.50	900 / 35.43	1000 / 39.37	1100 / 43.31	1350 / 53.15	1450 / 57.09	

\*Dimension b only for P1.2 (IIA) and P1.1 (IIB3).

**Table 2: Selection of the explosion group**

MESG	Expl. Gr. (IEC/CEN)	Gas Group (NEC)	Special approvals upon request.
> 0.90 mm	IIA	D	
≥ 0.65 mm	IIB3	C	

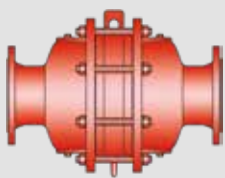
**Table 3: Selection of max. operating pressure**

NG	150 6"	150 6"	200 8"	300 12"	400 16"	500 20"	600 24"	800 32"	1000 40"	1200 48"	1400 56"	1600 64"	
DN	≤ 50 2"	80 3"	≤ 100 4"	≤ 150 6"	≤ 200 8"	≤ 250 10"	≤ 300 12"	≤ 400 16"	≤ 500 20"	≤ 600 24"	≤ 800 32"	≤ 800 32"	
Expl. Gr.	IIA	P <sub>max</sub> 1.8 / 26.1	1.8 / 26.1	1.5 / 21.7	1.5 / 21.7	1.5 / 21.7	1.5 / 21.7	1.5 / 21.7	1.4 / 20.3	1.3 / 18.8	1.3 / 18.8	1.2 / 17.4	1.1 / 15.9
	IIB3	P <sub>max</sub> 1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9

P<sub>max</sub> = maximum allowable operating pressure in bar / psi absolut, higher operating pressure upon request.







## In-Line Deflagration Flame Arrester

concentric design,  
bi-directional

**PROTEGO® FA-I**

**Table 4: Max. allowable L/D-ratio**

standard												
NG	150 6"	150 6"	200 8"	300 12"	400 16"	500 20"	600 24"	800 32"	1000 40"	1200 48"	1400 56"	1600 64"
DN	≤ 50 2"	80 3"	≤ 100 4"	≤ 150 6"	≤ 200 8"	≤ 250 10"	≤ 300 12"	≤ 400 16"	≤ 500 20"	≤ 600 24"	≤ 800 32"	≤ 800 32"
(L/D) <sub>max</sub>	50	50	50	50	50	50	50	50	50	50	50	50
IIA P <sub>max</sub>	1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.2 / 17.4	1.3 / 18.8	1.3 / 18.8	1.2 / 17.4	1.1 / 15.9
Classification	-	-	-	-	-	-	-	-	-	-	-	-
(L/D) <sub>max</sub>	50	50	40	40	35	35	35	30	30	30	25	25
IIB3 P <sub>max</sub> (bar /psi)	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9
Classification	-	-	X6	X6	X7	X7	X7	X8	X8	X8	X9	X9

**Table 5: Specification of max. operating temperature**

≤ 60°C / 140°F	T <sub>maximum allowable operating temperature in °C</sub>	Higher operating temperatures upon request.
-	Classification	

**Table 6: Material selection for housing**

Design	A	B	C	
Housing	Steel	Stainless Steel	Hastelloy	The housing can also be delivered in carbon steel with an ECTFE coating.
Gasket	PTFE	PTFE	PTFE	
Flame arrester unit	A, B	C	D	

Special materials upon request.

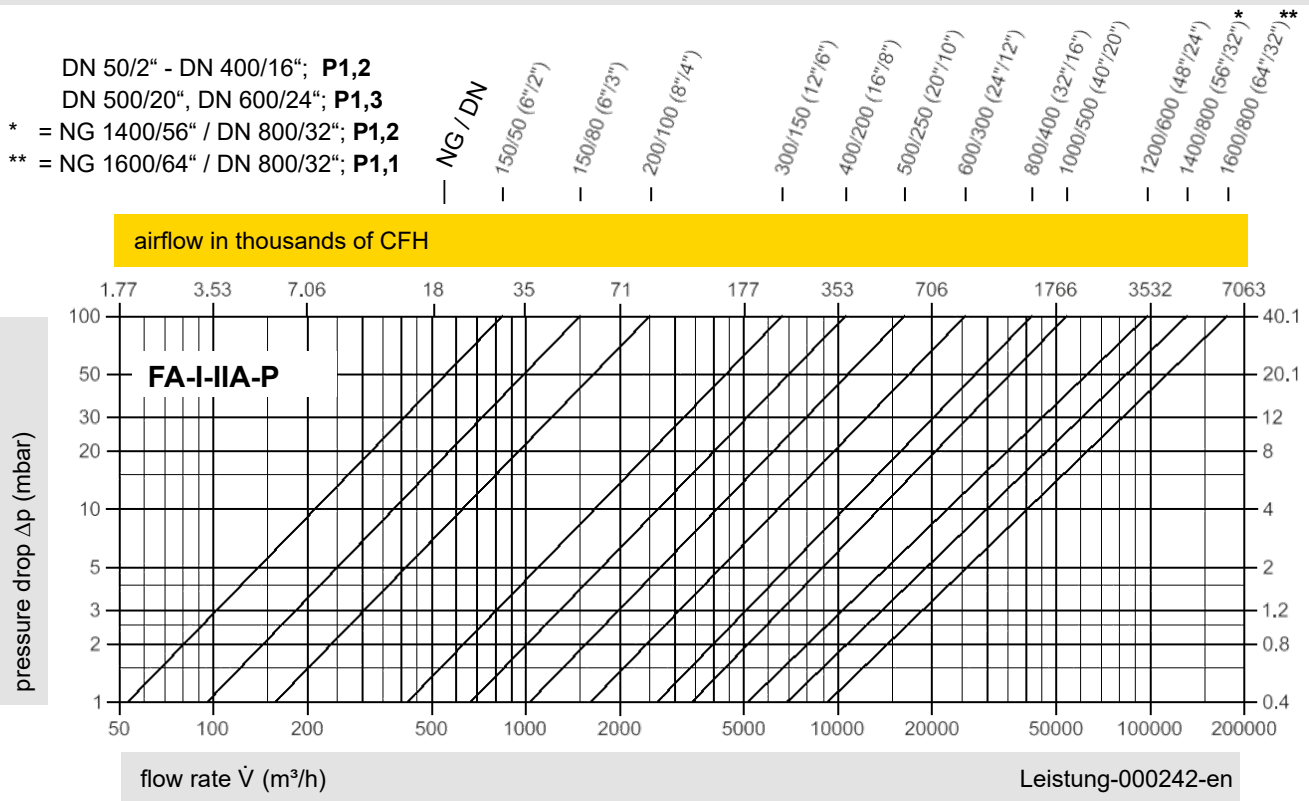
**Table 7: Material combinations of the flame arrester unit**

Design	A	C	D	
FLAMEFILTER® casing	Steel	Stainless Steel	Hastelloy	* the FLAMEFILTER® is also available in Tantalum, Inconel, Copper, etc., when the listed housing and casing materials are used.
FLAMEFILTER® *	Stainless Steel	Stainless Steel	Hastelloy	
Spacers	Stainless Steel	Stainless Steel	Hastelloy	

Special materials upon request.

**Table 8: Flange connection type**

EN 1092-1; Form B1	Other types upon request.
ASME B16.5 CL 150 R.F.	

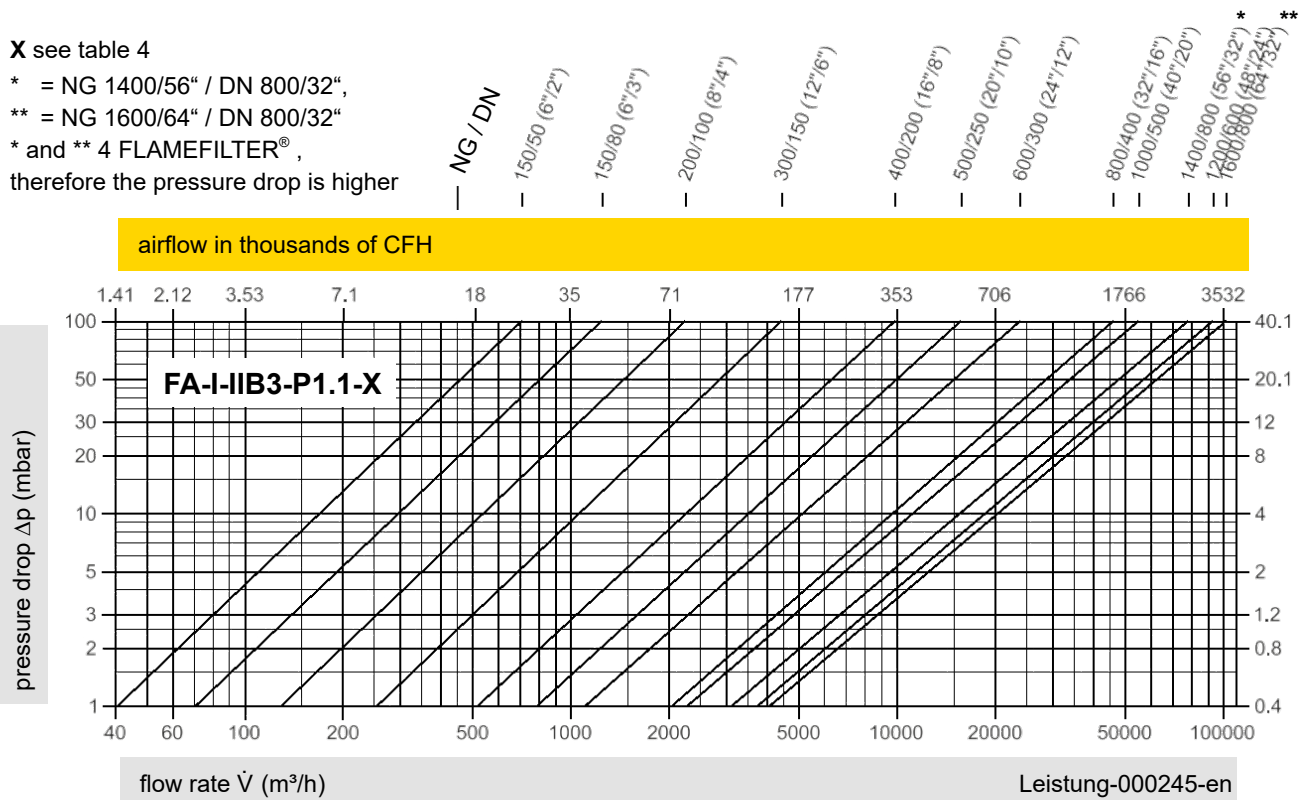


X see table 4

\* = NG 1400/56" / DN 800/32",

\*\* = NG 1600/64" / DN 800/32"

\* and \*\* 4 FLAMEFILTER®,  
 therefore the pressure drop is higher

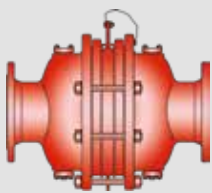


The flow capacity charts have been determined with a calibrated and TÜV certified flow capacity test rig.

Volume flow  $\dot{V}$  in (m³/h) and CFH refer to the standard reference conditions of air in ISO 6358 (20°C, 1bar).

For conversion to other densities and temperatures, refer to Sec. 1: "Technical Fundamentals."

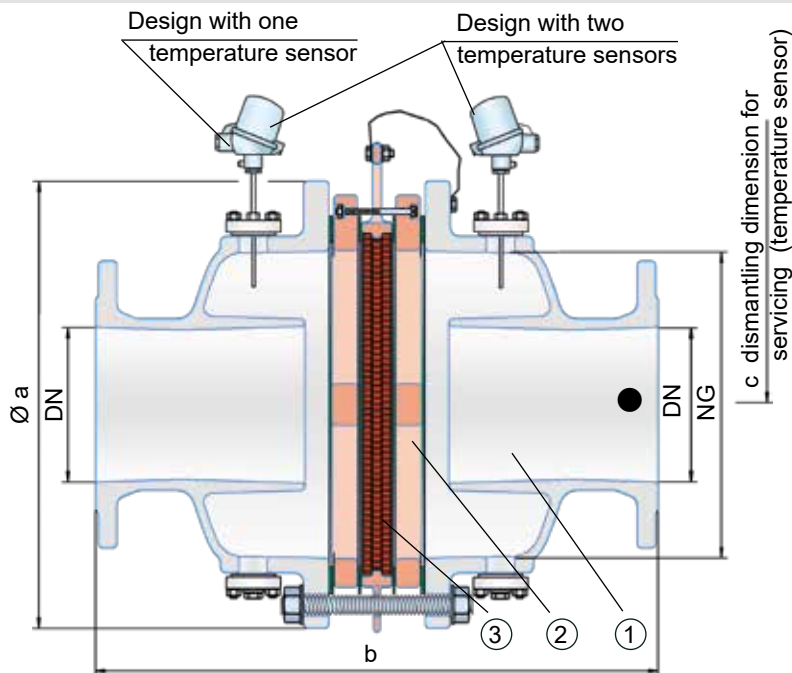




## In-Line Deflagration Flame Arrester

concentric design,  
bidirectional

**PROTEGO® FA-I-PTFE**



● Connection to the protected side  
(only for type FA-I-PTFE-T-...)

### Special Features and Advantages

- build up of adhesive materials is prevented by the smooth surfaces
- application especially for corrosive and polymerizing media
- minimum number of FLAMEFILTER® discs due to patented design
- service-friendly design
- the modular design enables each individual FLAMEFILTER® to be replaced
- bidirectional operation as well as any direction of flow
- installation of temperature sensors is possible
- less soiling of the device lowers service, operating and life-cycle costs
- minimum pressure loss and associated low operating and life-cycle costs

### Function and Description

The in-line deflagration flame arresters type PROTEGO® FA-I-PTFE are the latest generation of flame arresters and are distinguished by their unique resistance to adhesive and corrosive media. The use of fluoroplastics as a high-tech housing coating and as solid material for the flame arrester element is unique throughout the world.

When installing the deflagration flame arrester make sure that the distance between potential ignition sources and the location of the installed device, the L/D ratio (pipe length/pipe diameter), does not exceed the value of 50.

The deflagration flame arrester is symmetrical and offers bidirectional flame transmission protection. The arrester essentially consists of two coated housing parts (1) and the PROTEGO® flame arrester unit (2) in the center. The PROTEGO® flame arrester unit is modular and consists of several FLAMEFILTER® discs (3) and spacers firmly held in a FLAMEFILTER® casing. The number of PTFE-FLAMEFILTER® discs and their gap size depends on the arrester's conditions of use.

The deflagration flame arrester PROTEGO® FA-I-PTFE can be used for explosion group IIA (NEC group D). The standard design is approved at an operating temperature up to +60°C / 140°F. The maximum allowable operating pressure depends on nominal diameter (DN) and nominal size (NG) and amounts to a maximum of 1.6 bar / 23.2 psi absolute (for DN 100 / 4" and DN 150 / 6" see table 3).

Type-approved according to ATEX Directive 94/9/EC and EN ISO 16852 as well as other international standards.

### Design Types and Specifications

There are three different designs available:

- |   |   |
|---|---|
| Basic in-line deflagration flame arrester   | <b>FA-I-PTFE -</b> <input type="checkbox"/> |
| In-line deflagration flame arrester with integrated temperature sensor* as additional protection against short time burning from one side         | <b>FA-I-PTFE -</b> <input type="checkbox"/> |
| In-line deflagration flame arrester with two integrated temperature sensors* for additional protection against short time burning from both sides | <b>FA-I-PTFE -</b> <input type="checkbox"/> |

Additional special flame arresters upon request.

\*Resistance thermometer for device group II, category (1) 2 (GII cat. (1) 2)

**Table 1: Dimensions**

Dimensions in mm / inches

To select nominal width/nominal size (NG/DN) - combination, please use the flow capacity chart on the following page.

NG	150 / 6"	150 / 6"	200 / 8"	300 / 12"
DN	≤ 50 / 2"	80 / 3"	≤ 100 / 4"	≤ 150 / 6"
a	287 / 11.30	287 / 11.30	342 / 13.46	447 / 17.60
b	380 / 14.96	380 / 14.96	468 / 18.43	612 / 24.09
c	430 / 16.93	430 / 16.93	480 / 18.90	530 / 20.87

**Table 2: Selection of the explosion group**

MESG	Expl. Gr. (IEC/CEN)	Gas Group (NEC)	Special approvals upon request.
> 0.90 mm	IIA	D	

**Table 3: Selection of max. operating pressure**

NG	150 / 6"	150 / 6"	200 / 8"	300 / 12"
DN	≤ 50 / 2"	80 / 3"	≤ 100 / 4"	≤ 150 / 6"
P <sub>max</sub>	1.6 / 23.2	1.6 / 23.2	1.2 / 17.4	1.2 / 17.4

P<sub>max</sub> = in bar / psi absolut, higher operating pressure upon request.**Table 4: Specification of max. operating temperature**

≤ 60°C / 140°F	T <sub>maximum allowable operating temperature in °C</sub>	Higher operating temperatures upon request.
-	Classification	

**Table 5: Material for housing**

Design	A
Housing	Steel with an ECTFE coating
Gasket	PTFE
Flame arrester unit	A, B, C

Special materials upon request.

**Table 6: Material combinations of the flame arrester unit**

Design	A	B	C
FLAMEFILTER® casing	Steel with an ECTFE coating	Hastelloy	Stainless Steel
Spider rings	Steel with an ECTFE coating	Hastelloy	Stainless Steel
FLAMEFILTER® *	PTFE*	PTFE*	PTFE*
Spacer	PEEK / ETFE / FEP	PEEK / ETFE / FEP	PEEK / ETFE / FEP

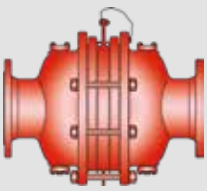
Special materials upon request.

\* electrically conductive

**Table 7: Flange connection type**

EN 1092-1; Form B1	Other types upon request.
ASME B16.5 CL 150 R.F.	



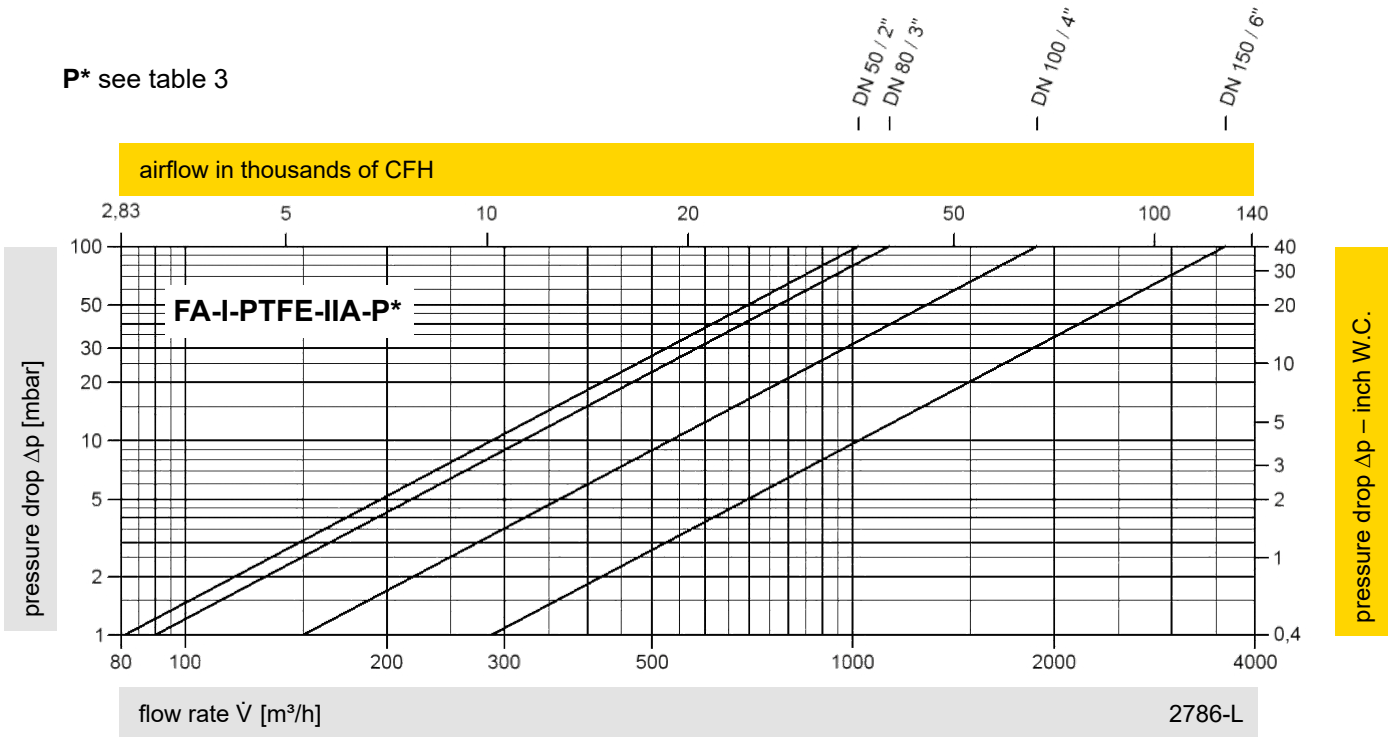


# In-Line Deflagration Flame Arrester

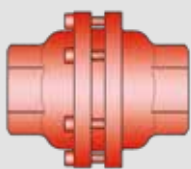
## Flow Capacity Chart

**PROTEGO® FA-I-PTFE**

P\* see table 3



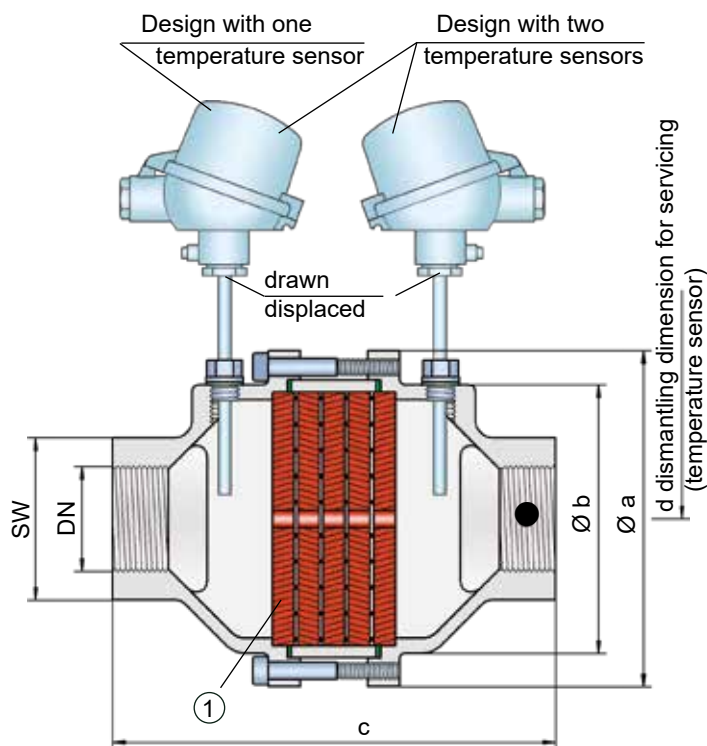
The flow capacity charts have been determined with a calibrated and TÜV certified flow capacity test rig. Volume flow  $\dot{V}$  in (m³/h) and CFH refer to the standard reference conditions of air in ISO 6358 (20°C, 1bar). For conversion to other densities and temperatures, refer to Sec. 1: "Technical Fundamentals."



## In-Line Detonation Flame Arrester

for stable detonations and deflagrations in a straight through design,  
bi-directional

**PROTEGO® DA-G**



- Connection to the protected side (only for type DA-G-T-...)

### Function and Description

The PROTEGO® DA-G series is a compact in-line detonation flame arrester for installation in pipes with diameters up to 2" and is used, for example, in industrial applications such as gas analysis lines.

Once a detonation enters the flame arrester, energy is absorbed from the shock wave, and the flame is extinguished in the narrow gaps of the FLAMEFILTER® (1).

The PROTEGO® flame arrester unit consists of several FLAMEFILTER® discs firmly held in a housing. The gap size and number of FLAMEFILTER® discs are determined by the operating data and parameters of the mixture flowing in the line (explosion group, pressure, temperature).

To provide an optimum result between the housing size, number of FLAMEFILTER® discs and their gap size, a device was developed that can be used for all explosion groups - IIA, IIB3 and IIC (NEC Group D, C MESG  $\geq 0.65$  mm and B). The standard design can be used with an operating temperature of up to +60°C / 140°F and an absolute operating pressure up to 1.1 bar / 15.9 psi. **Devices with special approvals for higher pressures (see table 4) and higher temperatures are available upon request.**

The device is bi-directional and equipped with a threaded connection. This can be adapted to international standards. The detonation arrester can be used at any location in the pipe, regardless of the location of the ignition source.

Type-approved in accordance with the current ATEX Directive and EN ISO 16852, as well as other international standards.

### Special Features and Advantages

- bi-directional
- modular design
- quick removal and installation of the individual FLAMEFILTER®
- easy maintenance and replacement of the individual FLAMEFILTER®
- Various uses possible
- Installation of temperature sensors for G 1½ and G 2 possible
- cost-effective spare parts

### Design Types and Specifications

There are three different designs available:

Basic design of the DA-G in-line detonation flame arrester, size ½" to 2"

DA-G-

In-line detonation flame arrester with integrated temperature sensor\* as additional protection against short burning from one side, size 1½" to 2"

DA-G-  T

In-line detonation flame arrester with two integrated temperature sensors\* as additional protection against short-time burning from both sides, size 1½" to 2"

DA-G-  TB

\*Resistance thermometer for device group II, category (1) 2 (GII cat. (1) 2)

Flange connection available upon request.

**Table 1: Dimensions**

Dimensions in mm / inches, SW = width across flats

To select the nominal size (DN), please use the flow capacity charts on the following pages.

DN	G ½	G ¾	G 1	G 1 ¼	G 1 ½	G 2
a	80 / 3.15	80 / 3.15	100 / 3.94	100 / 3.94	155 / 6.10	155 / 6.10
b	55 / 2.17	55 / 2.17	76 / 2.99	76 / 2.99	124 / 4.88	124 / 4.88
c (IIA)	112 / 4.41	112 / 4.41	122 / 4.80	122 / 4.80	205 / 8.07	205 / 8.07
c (IIB3 and IIC)	135 / 5.31	135 / 5.31	145 / 5.71	145 / 5.71	205 / 8.07	205 / 8.07
d	—	—	—	—	400 / 15.75	400 / 15.75
SW	32 / 1.26	32 / 1.26	50 / 1.97	50 / 1.97	75 / 2.95	75 / 2.95

**Table 2: Selection of the explosion group**

MESG	Expl. Gr. (IEC/CEN)	Gas Group (NEC)	Special approvals upon request.
> 0,90 mm	IIA	D	
≥ 0,65 mm	IIB3	C	
< 0,50 mm	IIC	B	

**Table 3: Selection of max. operating pressure**

DN		G ½	G ¾	G 1	G 1 ¼	G 1 ½	G 2	P <sub>max</sub> = maximum allowable operating pressure in bar / psi (absolute); higher operating pressure upon request.	
Expl. Gr.	IIA	P <sub>max</sub>	1.2/17.4	1.2/17.4	1.1/15.9	1.1/15.9	1.1/15.9		1.1/15.9
	IIB3	P <sub>max</sub>	1.1/15.9	1.1/15.9	1.1/15.9	1.1/15.9	1.4/20.3		1.4/20.3
	IIC	P <sub>max</sub>	1.1/15.9	1.1/15.9	1.1/15.9	1.1/15.9	1.6/23.2		1.6/23.2

**Table 4: Specification of max. operating temperature**

≤ 60°C / 140°F	Tmaximum allowable operating temperature in °C	Higher operating temperatures upon request.
-	Classification	

**Table 5: Material selection**

Design	B	C	*The FLAMEFILTER® is also available in Tantalum, Inconel, Copper, etc., when the listed housing materials are used.
Housing	Stainless Steel	Hastelloy	
Gasket	PTFE	PTFE	
FLAMEFILTER®*	Stainless Steel	Hastelloy	

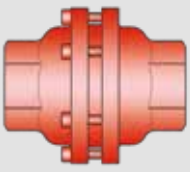
Special materials upon request.

**Table 6: Type of connection**

Pipe thread DIN ISO 228-1	DIN	Other types of thread upon request.
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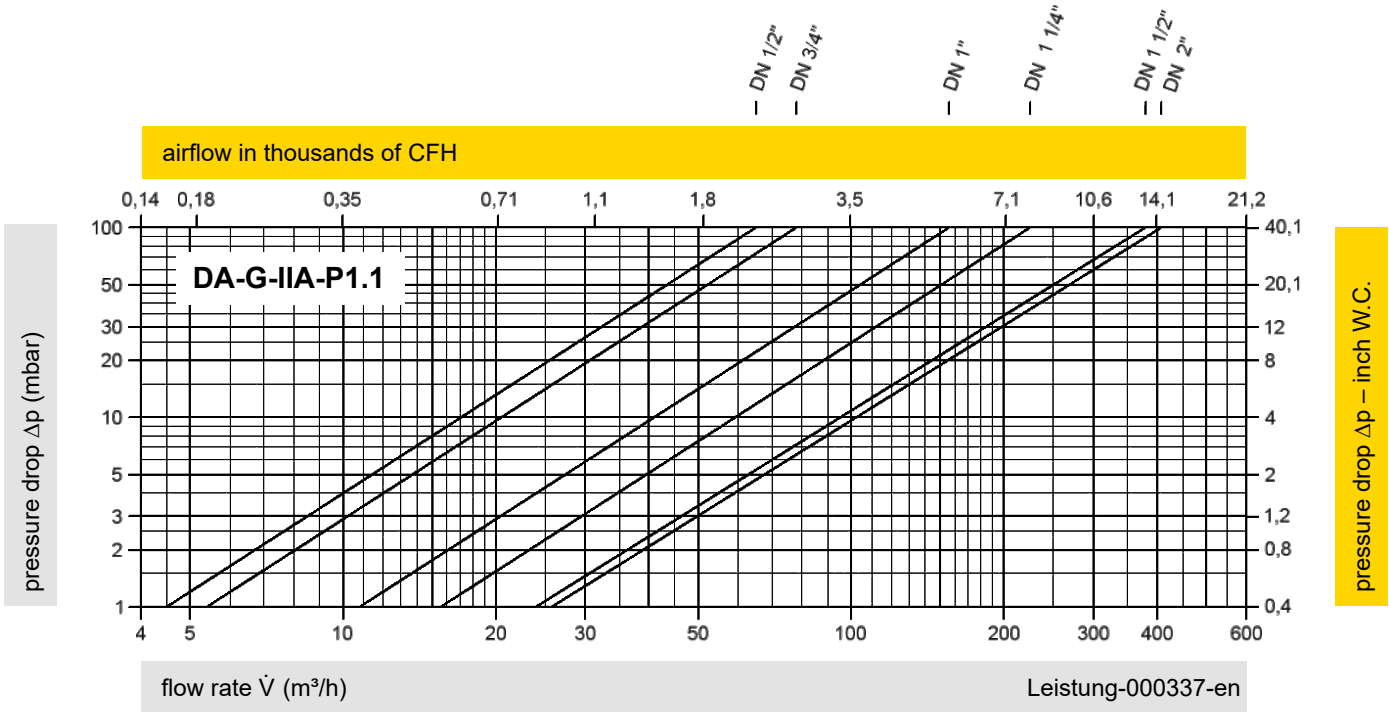
for safety and environment



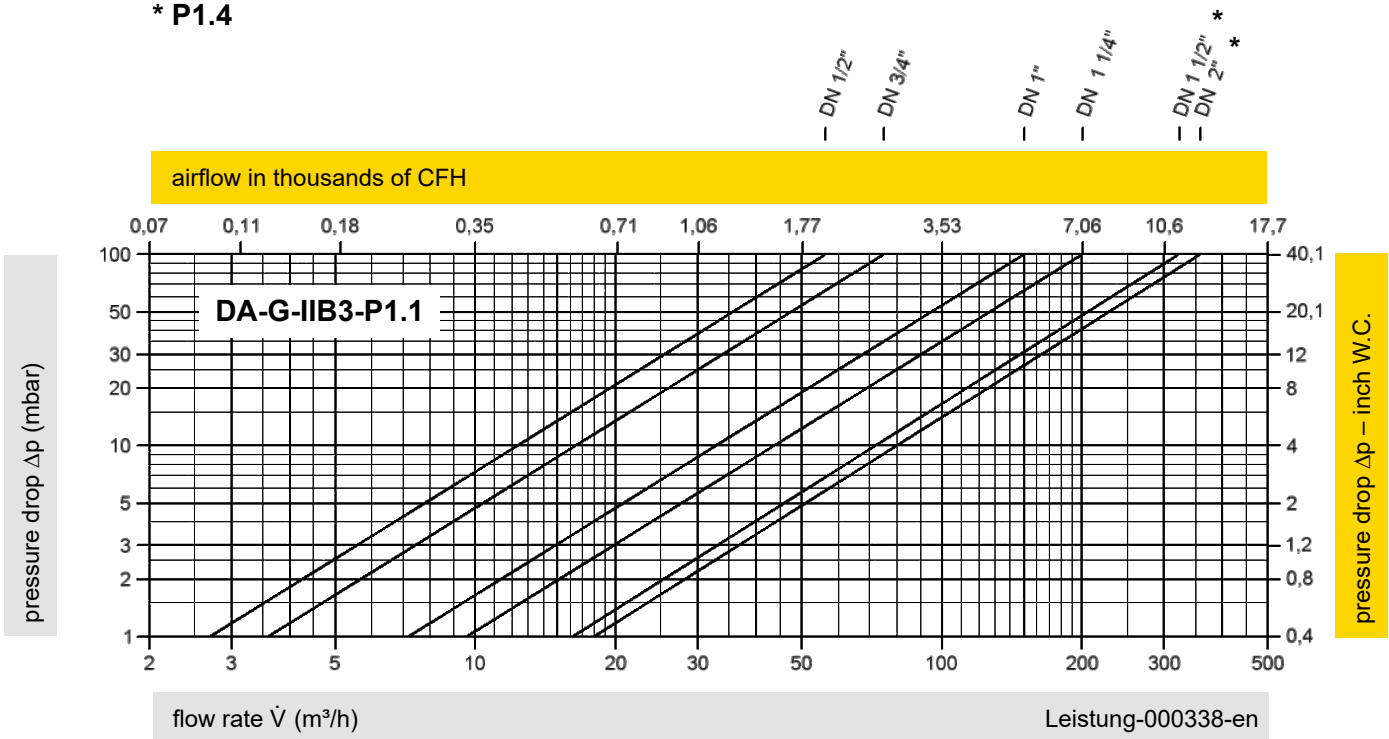
# In-Line Detonation Flame Arrester

## Flow Capacity Charts

### PROTEGO® DA-G



#### \* P1.4



The flow capacity charts have been determined with a calibrated and TÜV certified flow capacity test rig.  
 Volume flow  $\dot{V}$  in (m<sup>3</sup>/h) and CFH refer to the standard reference conditions of air in ISO 6358 (20°C, 1bar).  
 For conversion to other densities and temperatures, refer to Sec. 1: "Technical Fundamentals."



\* P1.6

