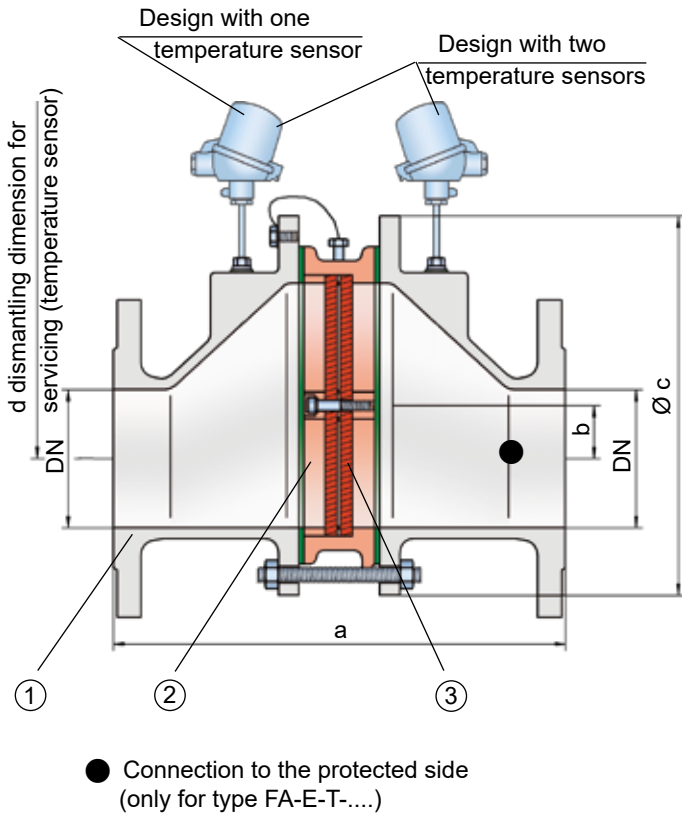


## In-Line Deflagration Flame Arrester

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.

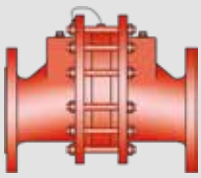
**Table 4: Specification of max. operating temperature**

≤ 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**

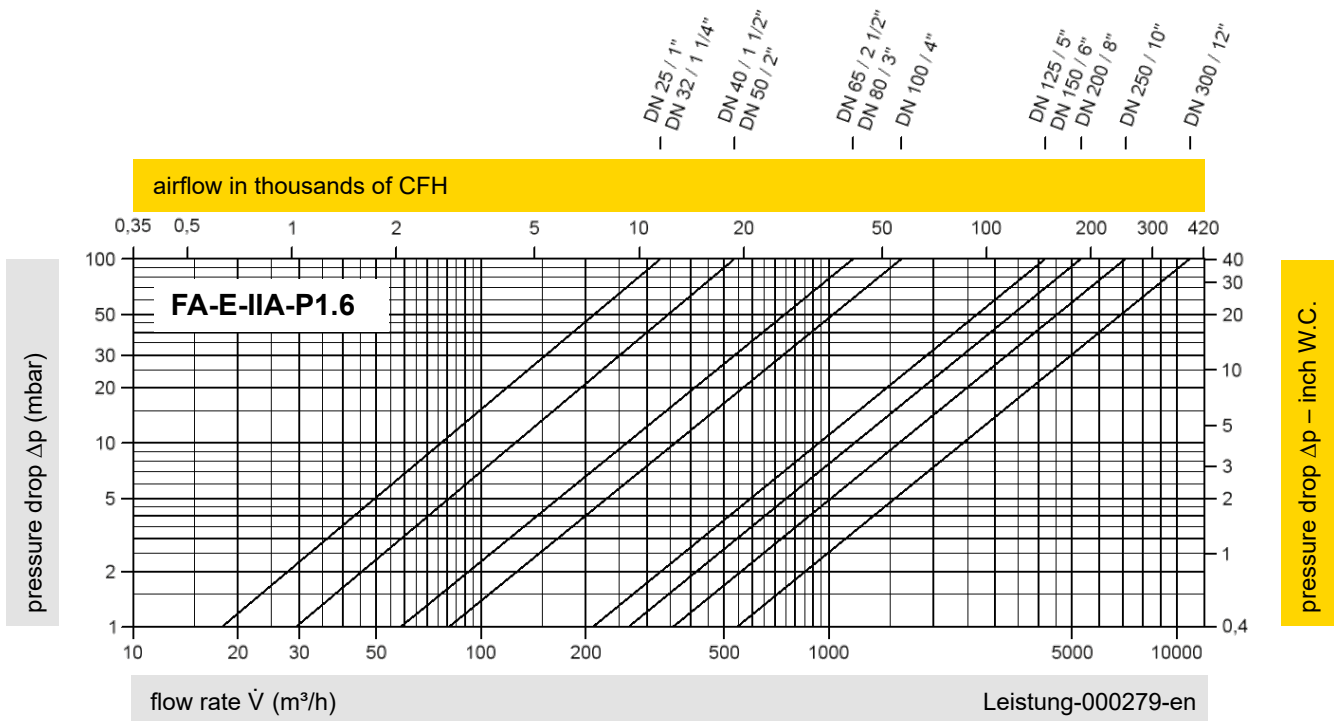
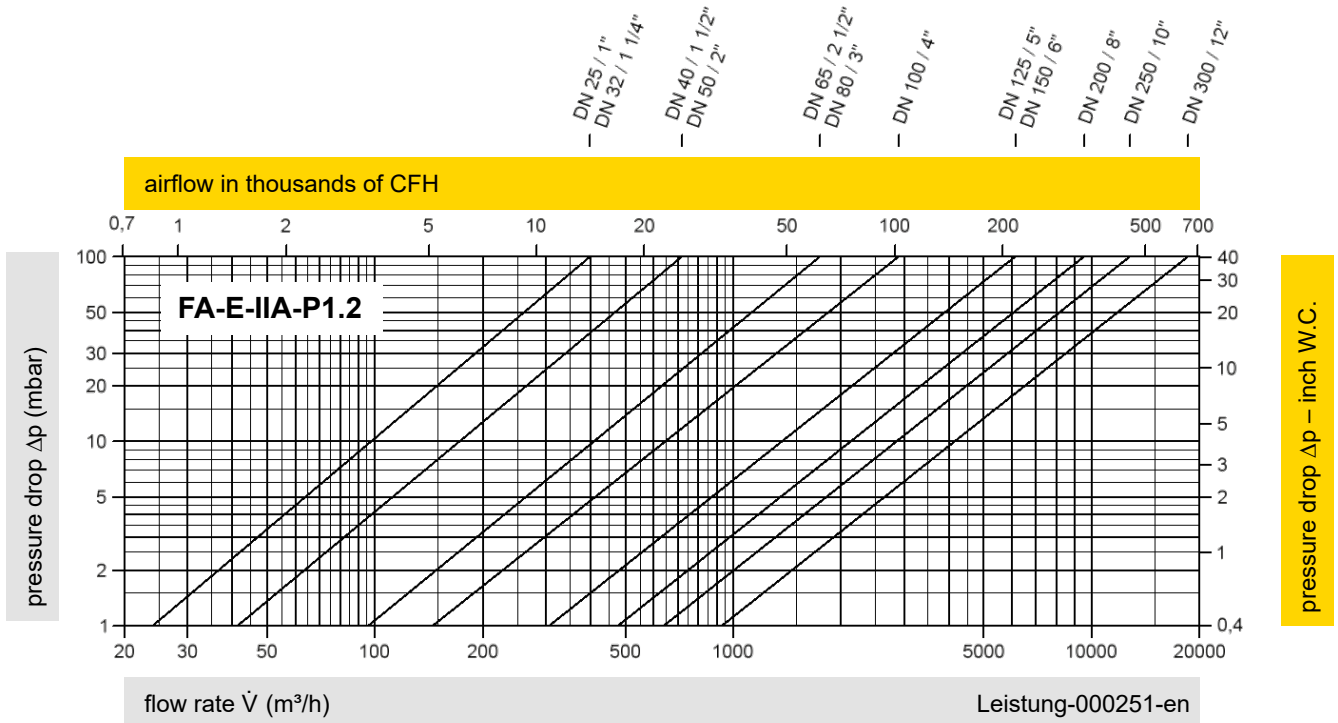
**Table 6: Material combinations of the flame arrester unit**

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.

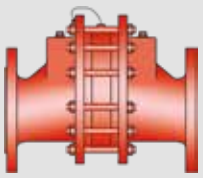
**Table 7: Flange connection type**

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



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."

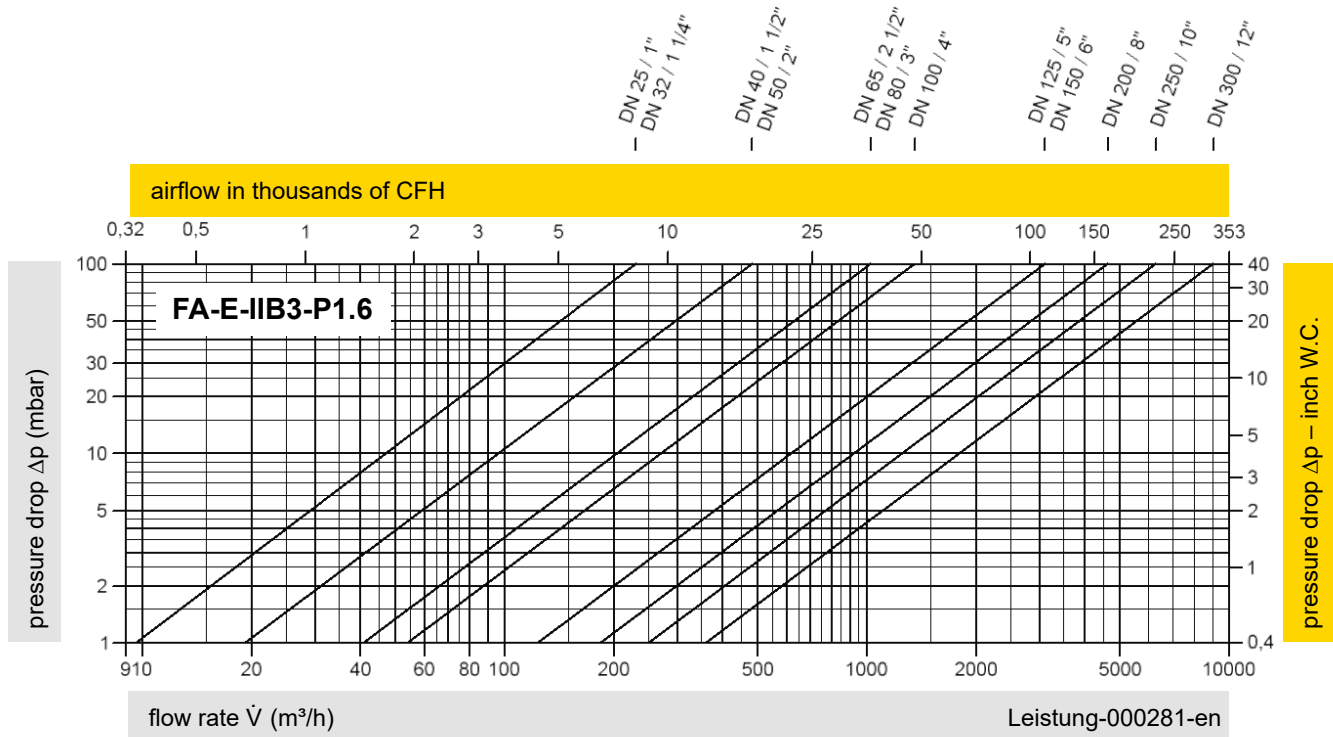
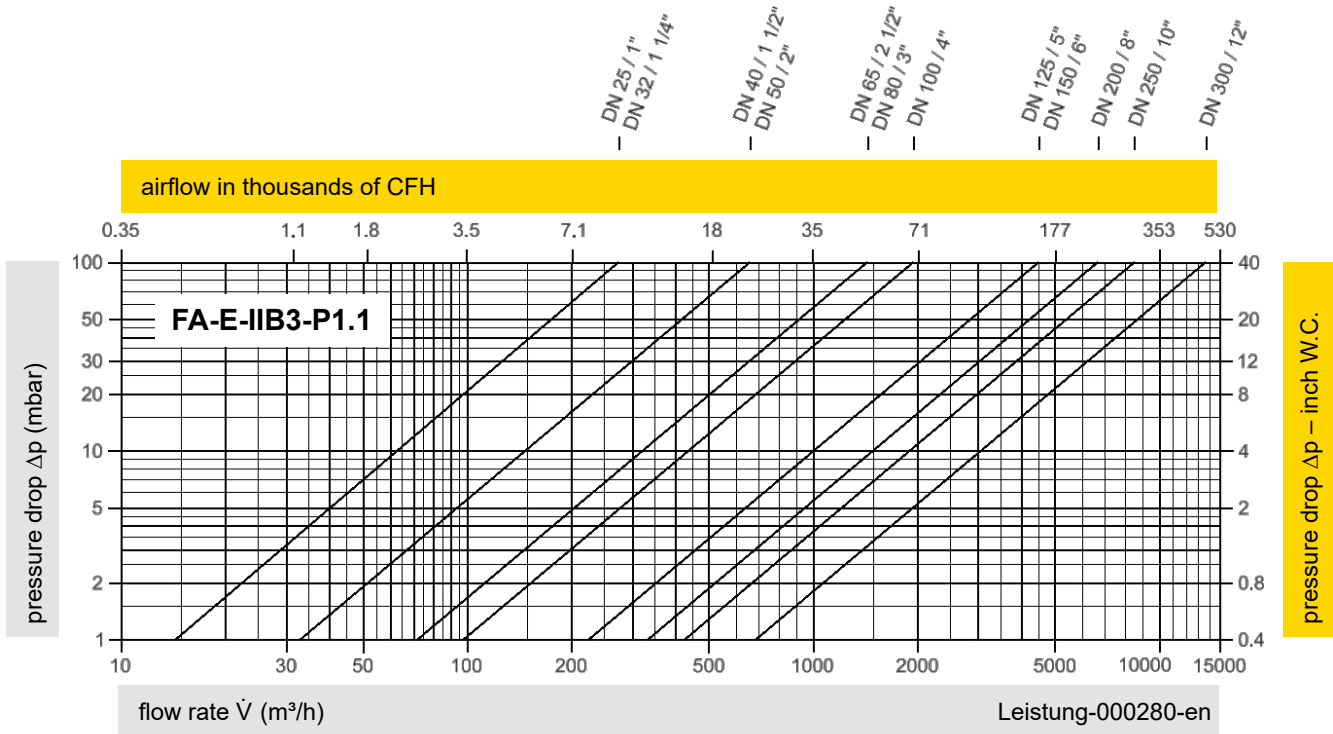




# In-Line Deflagration Flame Arrester

## 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 (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."

\* P1.2

