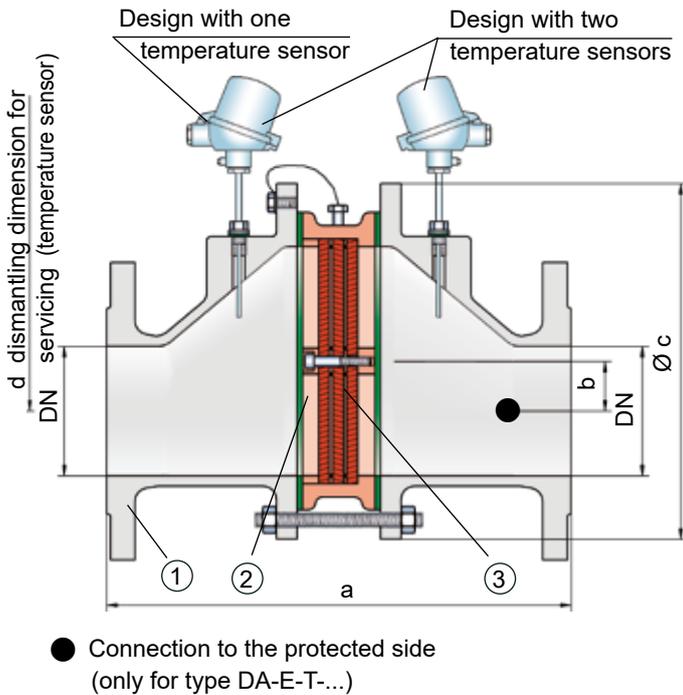


Eccentric In-Line Detonation Flame Arrester

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

PROTEGO® DA-E



Function and Description

The PROTEGO® DA-E series of detonation arresters are distinguished by its eccentric housing shape. When condensate accumulates within the PROTEGO® flame arrester unit, the design allows the liquid to drain without collecting large amounts in the housing. The eccentric design of the device has distinctive advantages over the classic flame arresters when installed at lower depths.

The detonation arrester is symmetrical and offers bi-directional flame arresting. The arrester essentially consists of two housing parts (1) and the PROTEGO® flame arrester unit (2) in the center. The PROTEGO® flame arrester unit consists of several FLAMEFILTER® discs (3) and spacers firmly held in a FLAMEFILTER® cage. The number of FLAMEFILTER® discs and their gap size depends on the arrester's intended use. By specifying the operating conditions, such as the temperature, pressure, explosion group, and the composition of the fluid, the optimum detonation arrester can be selected. The PROTEGO® DA-E series of flame arresters are available for explosion groups IIA to IIB3 (NEC Group D to C MESH ≥ 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 acc. to table 3. Devices with special approval for higher pressures and higher temperatures are available upon request.

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

EU conformity according to the currently valid ATEX directive. Approvals according to other national/international regulations on request.

Special Features and Advantages

- eccentric design prevents condensate build-up
- modular design enables replacement of the individual FLAMEFILTER® discs
- easy maintenance with fast assembly and disassembly of the FLAMEFILTER®
- advanced design allows for installation close to ground level
- bi-directional operation, as well as any flow direction and installation position
- provides protection against deflagration and stable detonation
- installation of temperature sensors possible
- cost-effective spare parts

Design Types and Specifications

There are three different designs available:

Basic design of the detonation arrester **DA-E-**

In-line detonation flame arrester with integrated temperature sensor* as additional protection against short-time burning of one side **DA-E-**

Detonation arrester with two integrated temperature sensors* as additional protection against short-time burning from both sides **DA-E-**

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

DN		25 1"	32 1 ¼"	40 1 ½"	50 2"	65 2 ½"	80 3"	100 4"	125 5"	150 6"	200 8"	250 10"	300 12"
Expl. Gr.	IIA	304/315* / 11.97/12.4*	304/315* / 11.97/12.4*	320/ 12.60	325/ 12.80	370/ 14.57	375/ 14.76	380/ 14.96	481/ 18.94	487/ 19.17	510/ 20.08	540/ 21.26	560/ 22.05
	IIB3	304/ 11.97	304/ 11.97	357/ 14.06	361/ 14.21	408/ 16.06	412/ 16.22	428/ 16.85	493/ 19.41	499/ 19.65	522/ 20.55	552/ 21.73	572/ 22.52
		29/ 1.14	29/ 1.14	29/ 1.14	29/ 1.14	38/ 1.50	38/ 1.50	39/ 1.53	65/ 2.56	65/ 2.56	55/ 2.17	58/ 2.28	60/ 2.36
		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
		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

* for IIA-P2.0

Table 2: Selection of the explosion group

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

Table 3: Selection of max. operating pressure

DN		25 1"	32 1 ¼"	40 1 ½"	50 2"	65 2 ½"	80 3"	100 4"	125 5"	150 6"	200 8"	250 10"	300 12"
Expl. Gr.	IIA	2.0 / 29.0	2.0 / 29.0	1.2 / 17.4									
	IIB3	1.1 / 15.9	1.1 / 15.9	1.2 / 17.4									

P_{max} = 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	
-	Classification	Higher operating temperatures upon request.

Table 5: Material selection for housing

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

Special materials upon request.

Table 6: Material combinations of the flame arrester unit

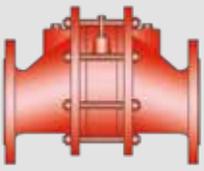
Design	A	C	D	
FLAMEFILTER® cage	Steel	Stainless Steel	Hastelloy	*The FLAMEFILTER® is also available in Tantalum, Inconel, Copper, etc., when the listed housing and cage materials are used.
FLAMEFILTER® *	Stainless Steel	Stainless Steel	Hastelloy	
Spacer	Stainless Steel	Stainless Steel	Hastelloy	

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.





Eccentric In-Line Detonation Flame Arrester

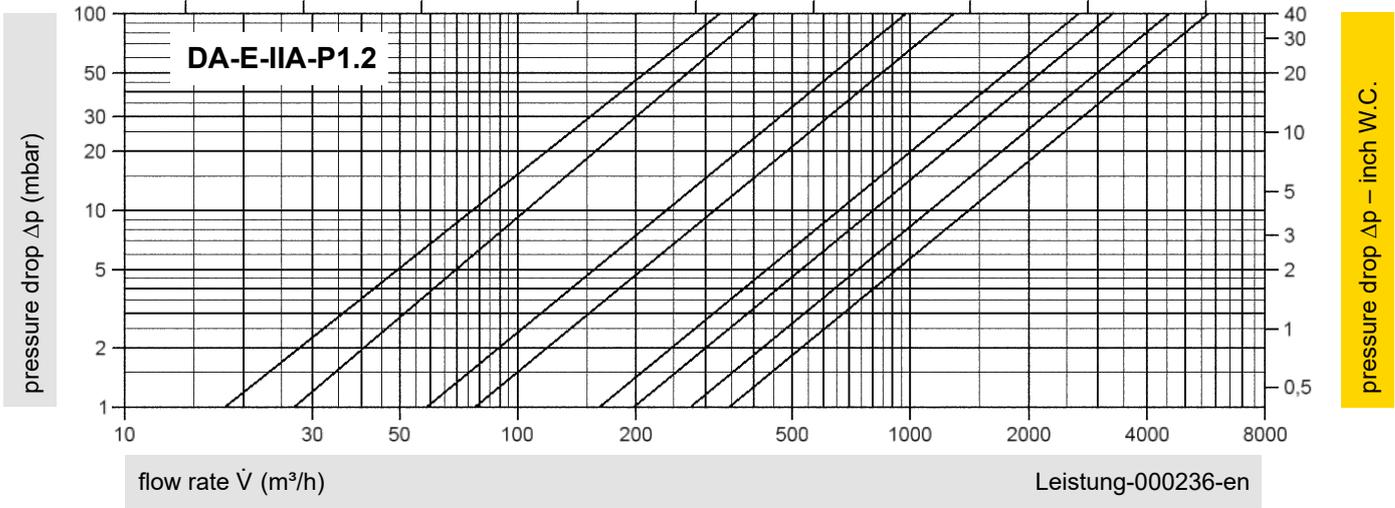
Flow Capacity Charts

PROTEGO® DA-E

* P1.3

DN 25 / 1" *
DN 32 / 1 1/4" *
DN 40 / 1 1/2" *
DN 50 / 2" *
DN 65 / 2 1/2"
DN 80 / 3"
DN 100 / 4"
DN 125 / 5"
DN 150 / 6"
DN 200 / 8"
DN 250 / 10"
DN 300 / 12"

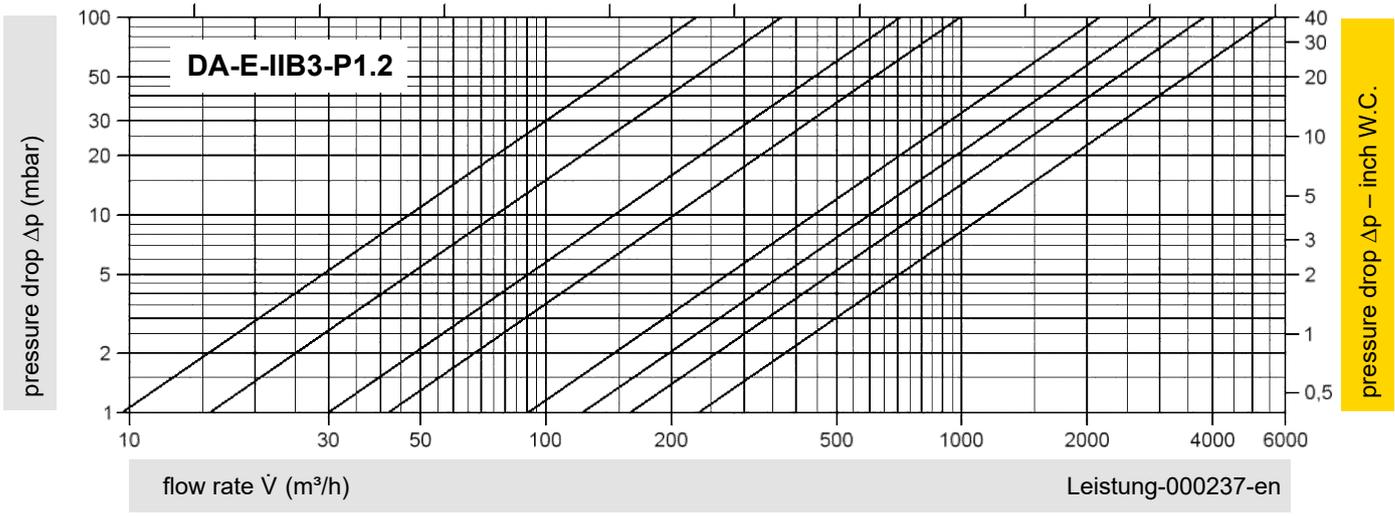
airflow in thousands of CFH



* P1.1

DN 25 / 1" *
DN 32 / 1 1/4" *
DN 40 / 1 1/2" *
DN 50 / 2" *
DN 65 / 2 1/2"
DN 80 / 3"
DN 100 / 4"
DN 125 / 5"
DN 150 / 6"
DN 200 / 8"
DN 250 / 10"
DN 300 / 12"

airflow in thousands of CFH



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."