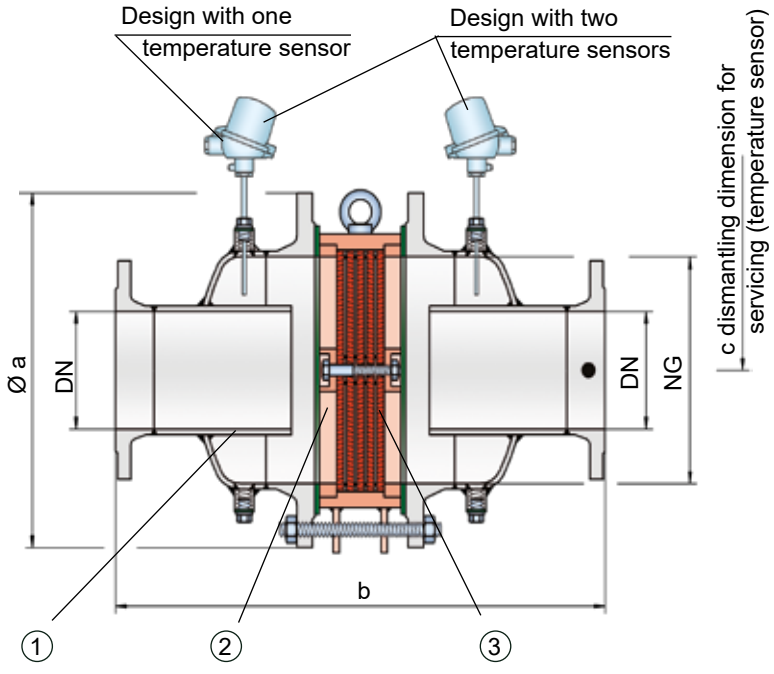


In-Line Detonation Flame Arrester

for unstable and stable detonations, and deflagrations in a straight-through design with a shock tube, bi-directional

PROTEGO® DA-UB



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

Function and Description

The type PROTEGO® DA-UB in-line detonation flame arresters are the newest generation of flame arresters. Based on fluid dynamic and explosion-dynamic calculations, as well as decades of field tests, a line was developed that offers minimum pressure loss and maximum safety. The device uses the Shock Wave Guide Tube Effect (SWGTE) to separate the flame front and shock wave. The result is an in-line detonation flame arrester without a classic shock absorber, and the use of flame-extinguishing elements is minimized.

The devices are symmetrical and offer bi-directional flame arresting for deflagrations and stable and unstable detonations. The arrester essentially consists of two housing parts with an integrated shock tube (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® 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 from a series of approved devices. PROTEGO® DA-UB flame arresters are available for explosion groups IIA to IIB3 (NEC group D to C MESG ≥ 0.65 mm).

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 temperatures and pressures (see table 3) 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

- optimized performance due to the patented *Shock Wave Guide Tube Effect (SWGTE)*
- low number of FLAMEFILTER® discs due to the patented shock tube *(SWGTE)*
- modular design enables replacement of the individual FLAMEFILTER® discs
- different designs allow scalable pressure loss over the area of the FLAMEFILTER®
- maintenance-friendly design
- advanced design for higher operating temperatures and pressures
- bi-directional operation, as well as any flow direction and installation position
- installation of temperature sensors possible
- minimal pressure loss resulting in low operating and lifecycle costs
- cost-effective spare parts

Design Types and Specifications

There are four different designs available:

Basic in-line detonation flame arrester	**DA-UB - – - –**
In-line detonation flame arrester with integrated temperature sensor* as additional protection against short-time burning	**DA-UB - T - –**
	DA-UB- TB - –
In-line detonation flame arrester with two integrated temperature sensors* for additional protection against short-time burning from both sides	**DA-UB - H - ☐**
In-line detonation flame arrester with heating jacket	

Additional special flame arresters upon request.

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

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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 for improved flow capacity upon request.

standard

NG		150 6“	150 6“	200 8“	300 12“	400 16“	500 20“	600 24“	700 28“	800 32“	1400 56“
DN		≤ 50 2"	80 3"	≤ 100 4"	≤ 150 6"	≤ 200 8"	≤ 250 10"	≤ 300 12"	≤ 350 14"	≤ 400 16"	≤ 600 24“
a		285 / 11.22	285 / 11.22	340 / 13.39	445 / 17.52	565 / 22.24	670 / 26.38	780 / 30.71	895 / 35.24	1015 / 39.96	1675 / 65.94
b	IIA -P1.1					700 / 27.56	800 / 31.50	1000 / 39.37	1200 / 47.24	1400 / 55.12	2200 / 86.61
	IIA-P1.2	388 / 15.28	388 / 15.28	488 / 19.21	626 / 24.65						
	IIB3-P1.1			500 / 19.69	638 / 25.12	724 / 28.50	824 / 32.44	1000 / 39.37	1200 / 47.24	1400 / 55.12	
	IIB3-P1.2	388 / 15.28	388 / 15.28								
c		500 / 19.69	500 / 19.69	520 / 20.47	570 / 22.44	620 / 24.41	670 / 26.38	720 / 28.35	770 / 30.31	820 / 32.28	1060 / 41.73

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

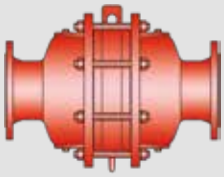
		NG	150 6“	150 6“	200 8“	300 12“	400 16“	500 20“	600 24“	700 28“	800 32“	1400 56“
		DN	≤ 50 2“	80 3“	≤ 100 4“	≤ 150 6“	≤ 200 8“	≤ 250 10“	≤ 300 12“	≤ 350 14“	≤ 400 6“	≤ 600 24“
Expl. Gr.	IIA	P_{max}	1.8 / 26.1	1.8 / 26.1	1.6 / 23.2	1.6 / 23.2	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.6/ 23.2
	IIB3	P_{max}	1.5 / 21.7	1.5 / 21.7	1.5 / 21.7	1.5 / 21.7	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	

P_{max} = maximum allowable operating pressure in bar / psi (absolute); higher operating pressure upon request.

In-between size up to P_{max} 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	



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Table 5: Material selection for housing

Design	A	B	C
Housing Heating jacket (DA-UB-(T)-H-...)	Steel Steel	Stainless Steel Stainless Steel	Hastelloy Stainless Steel
Gasket	PTFE	PTFE	PTFE
Flame arrester unit	A	B, C	D

The housing is also available in Steel with an ECTFE coating.

Special materials upon request.

Table 6: Material combinations of the flame arrester unit

Design	A	B	C	D
FLAMEFILTER® cage	Steel	Stainless Steel	Stainless Steel	Hastelloy
FLAMEFILTER® *	Stainless Steel	Stainless Steel	Hastelloy	Hastelloy
Spacer	Stainless Steel	Stainless Steel	Hastelloy	Hastelloy

*The FLAMEFILTER® is also available in Tantalum, Inconel, Copper, etc., when the listed housing and cage materials are used.

Special materials upon request.

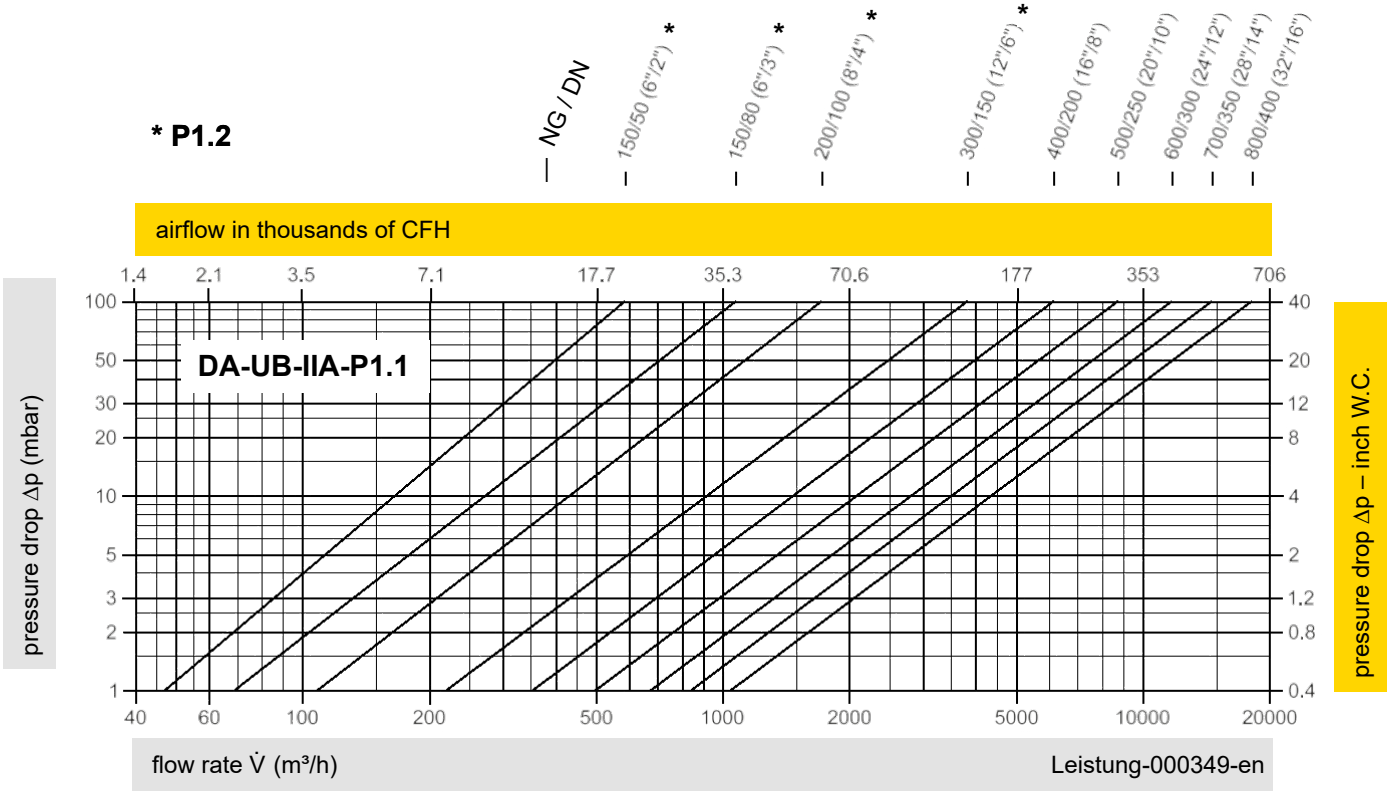
Table 7: Flange connection type

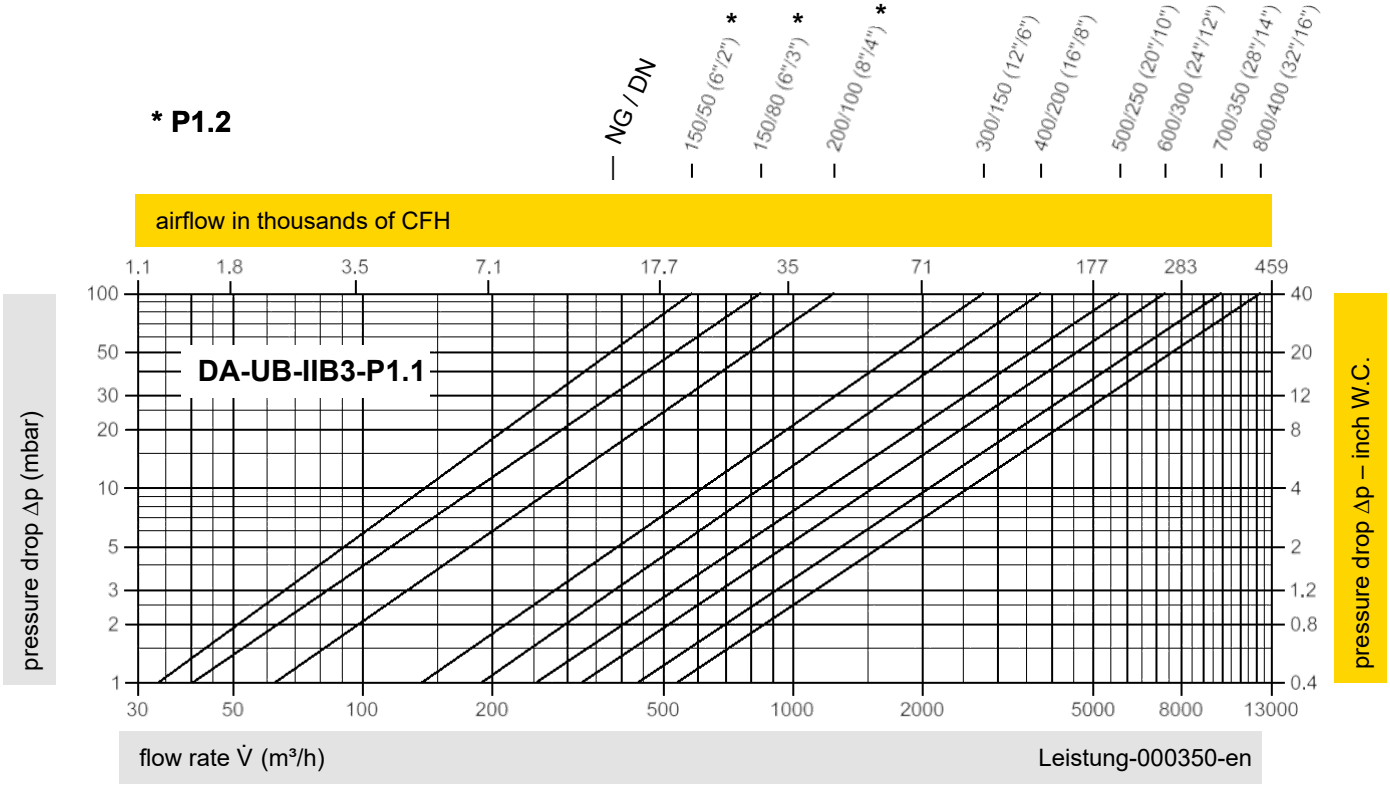
EN 1092-1; Form B1
ASME B16.5 CL 150 R.F.

Other types upon request.

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PROTEGO® DA-UB





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

PROTEGO
for safety and environment