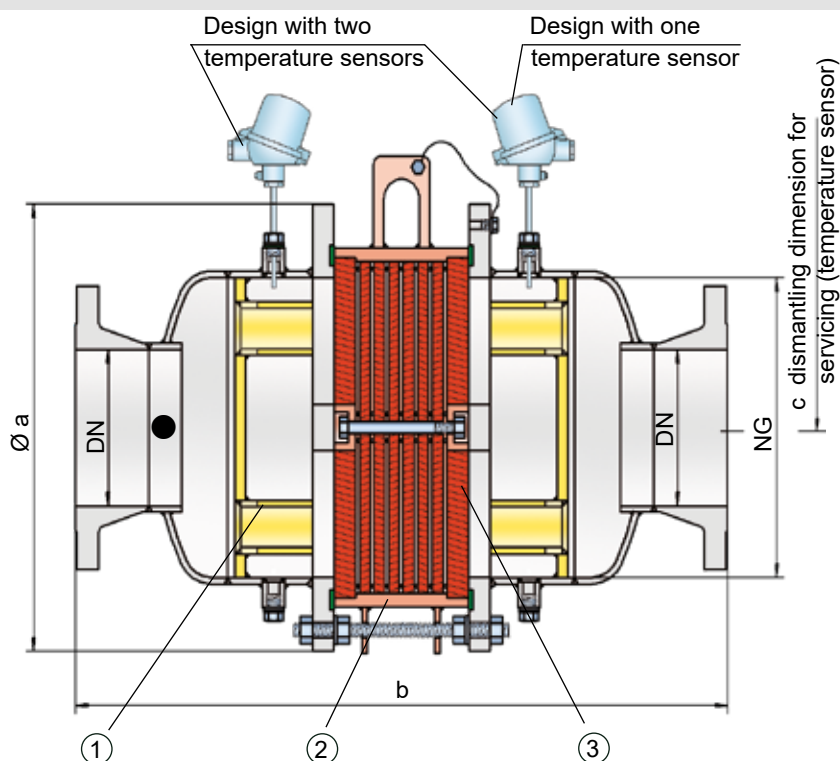


In-Line Detonation Flame Arrester

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

PROTEGO® DA-CG



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

Function and Description

The PROTEGO® DA-CG series of detonation arresters was mainly developed for the North American market and optimized to meet the demands of the US Coast Guard. The devices are symmetrical and offer bi-directional flame arresting for deflagrations and stable and unstable detonations.

The effective shock absorber (1) greatly reduces the speed of incoming detonations. This leads to improved flame extinguishing in the narrow gaps of the FLAMEFILTER® (3).

The flame arrester essentially consists of two housing parts with an integrated shock absorber and the PROTEGO® flame arrester unit (2) in the center. The PROTEGO® flame arrester unit is modular and consists of several FLAMEFILTER® discs 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 in-line detonation flame arrester can be selected. Type PROTEGO® DA-CG 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 at an operating temperature of up to +60°C / 140°F and an absolute operating pressure acc. to table 3. **Devices with special approvals for higher pressures and higher temperatures are available upon request.**

The flame arresters have been approved in accordance with the American Standard 33 CFR part 154 and are accepted by the US Coast Guard.

Special Features and Advantages

- provides protection against deflagrations and stable and unstable detonations
- low number of FLAMEFILTER® discs due to shock absorber technology
- modular design enables individual cleaning and replacement of the FLAMEFILTER® discs
- different design allow scalable pressure loss over the area of the FLAMEFILTER®
- maintenance-friendly design
- available in large nominal widths
- 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 three different designs available:

Basic in-line detonation flame arrester **DA-CG-**

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

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

Additional special flame arresters upon request.

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



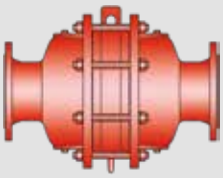
Table 1: Dimensions												Dimensions in mm / inches	
To select nominal width/nominal size (NG/DN) - combination, please use the flow capacity charts on the following pages.						Additional nominal width/nominal size (NG/DN) - combinations for improved flow capacity upon request.							
standard													
NG	150 6"	150 6"	200 8"	300 12"	400 16"	500 20"	600 24"	700 28"	800 32"	1000 40"	1200 48"		
DN	≤ 50 2"	80 3"	≤ 100 4"	≤ 150 6"	≤ 200 8"	≤ 250 10"	≤ 300 12"	≤ 350 14"	≤ 400 16"	≤ 500 20"	≤ 600 24"		
a	285 / 11.22	285 / 11.22	340 / 13.39	460 / 18.11	580 / 22.83	715 / 28.15	840 / 33.07		1025 / 40.35	1255 / 49.41	1485 / 58.46		
b (D)	594 / 23.39	570 / 22.44	620 / 24.41	720 / 28.35	852 / 33.54	1052 / 41.42	1202 / 47.32		1500 / 59.06	1700 / 66.93	2000 / 78.74		
b (C)	650 / 25.59	650 / 25.59	700 / 27.56	800 / 31.50	900 / 35.43	1100 / 43.31	1250 / 49.21		1548 / 60.94	-	-		
c	300 / 11.81	300 / 11.81	330 / 12.99	380 / 14.96	490 / 19.29	540 / 21.26	590 / 23.23		690 / 27.17	790 / 31.10	880 / 34.65		

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												
Expl. Gr.	NG	150 6"	150 6"	200 8"	300 12"	400 16"	500 20"	600 24"	700 28"	800 32"	1000 40"	1200 48"
	DN	≤ 50 2"	80 3"	≤ 100 4"	≤ 150 6"	≤ 200 8"	≤ 250 10"	≤ 300 12"	≤ 350 14"	≤ 400 16"	≤ 500 20"	≤ 600 24"
	IIA	P _{max}	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	1.2 / 17.4
	IIB3	P _{max}	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 / 23.26	1.6 / 23.2

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





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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	A	B	Special materials upon request.
Housing	Steel	Stainless Steel	
Gasket	PTFE	PTFE	
Flame arrester unit	A	B	

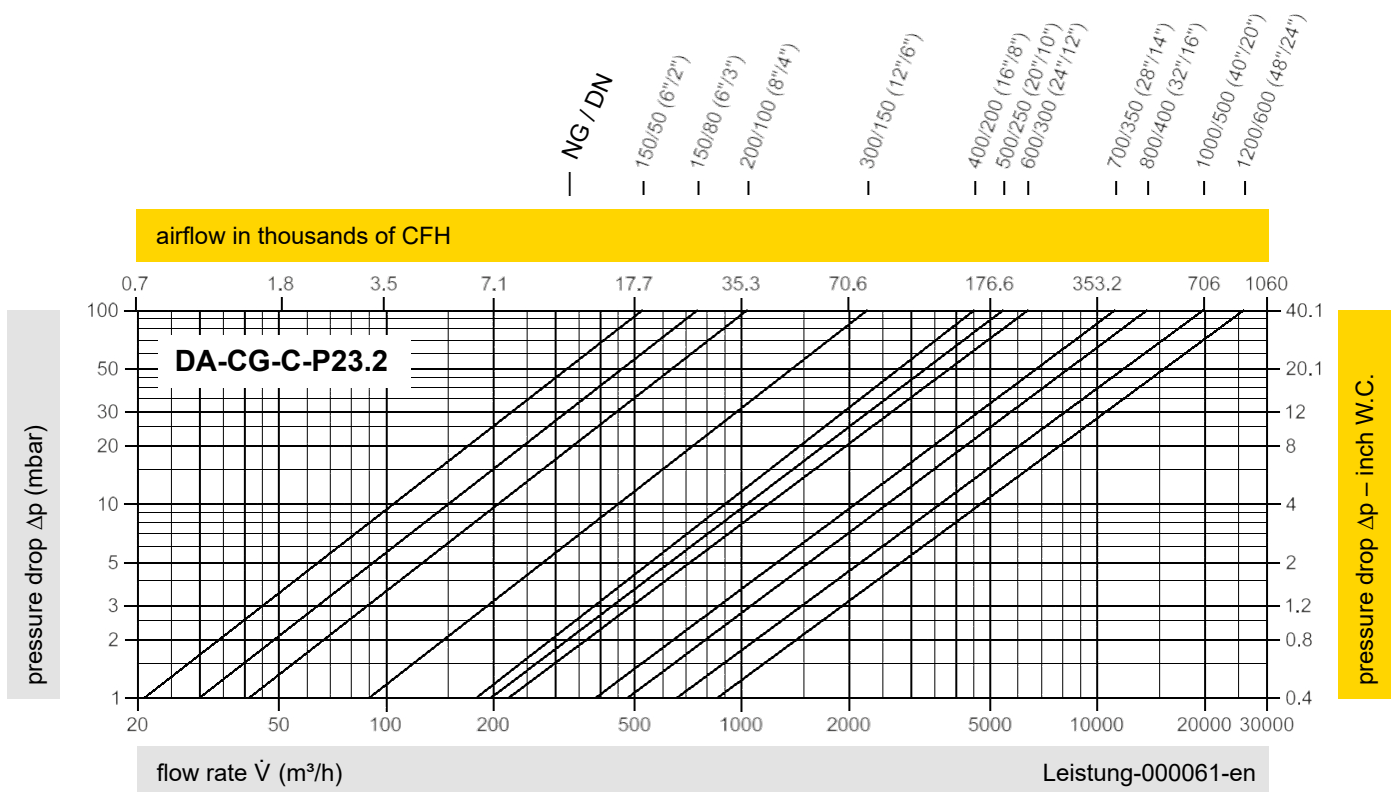
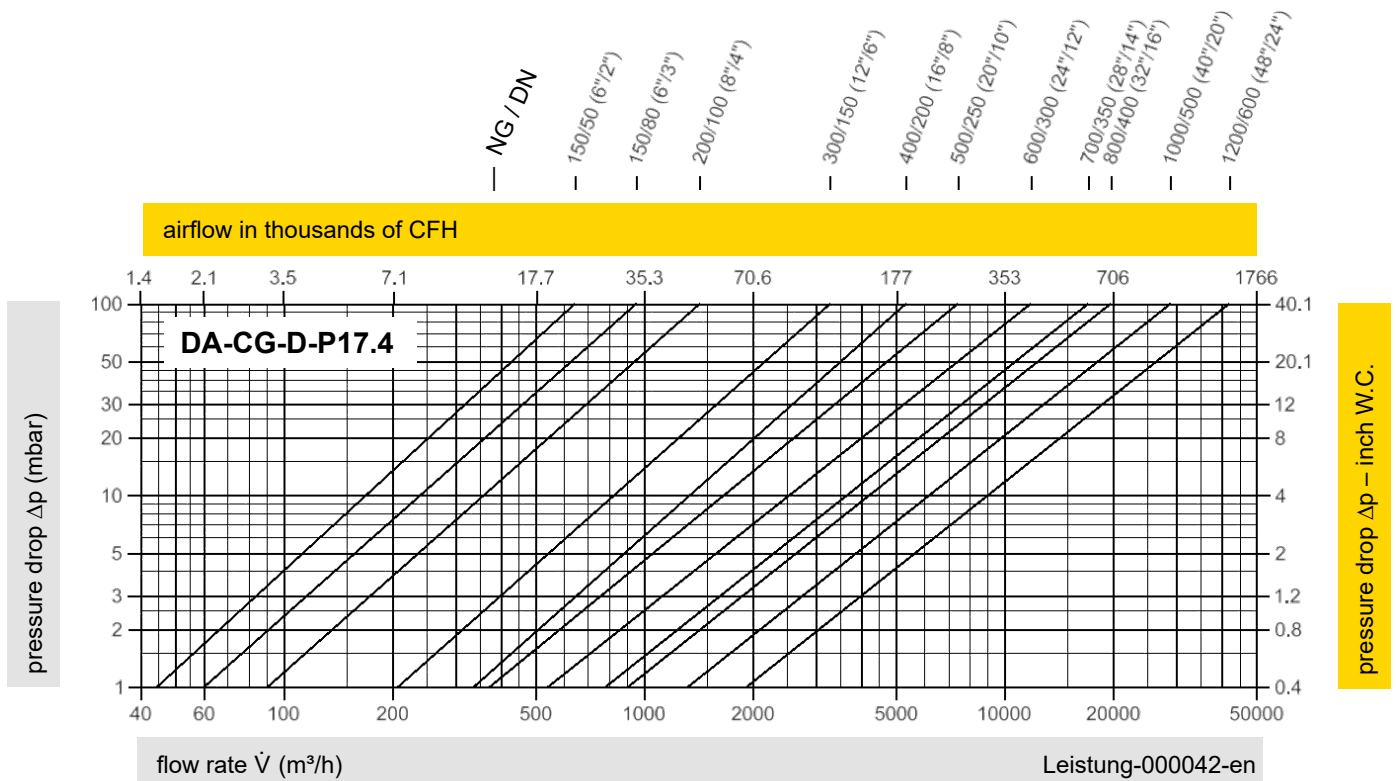
Table 6: Material combinations of the flame arrester unit

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

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 (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."

