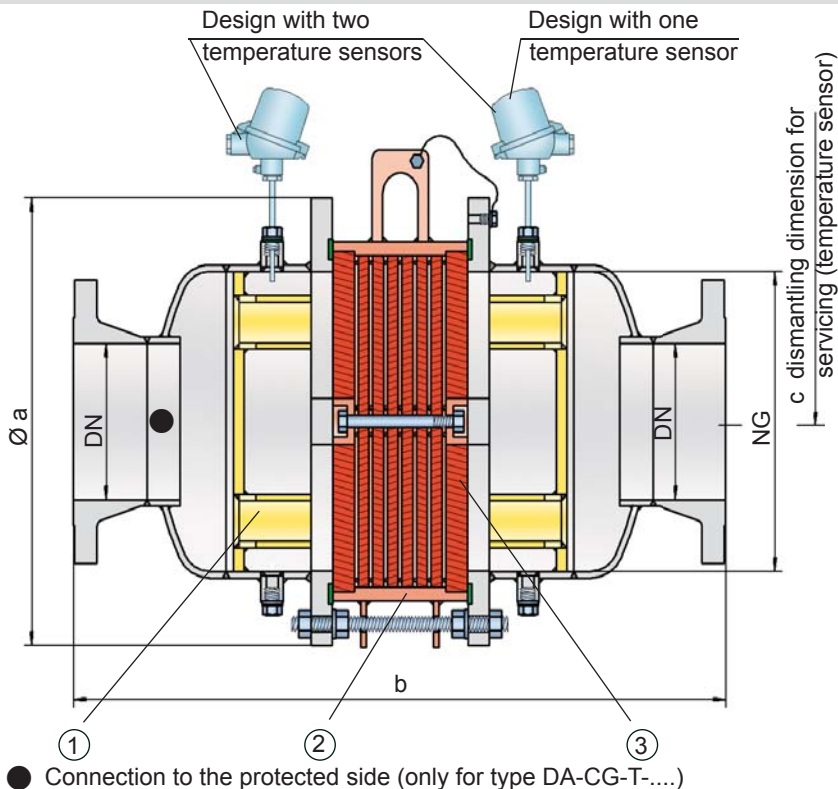


In-Line Detonation Flame Arrester

for unstable and stable detonations and deflagrations in a straight through design with shock absorber, bidirectional

PROTEGO® DA-CG



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 bidirectional flame arresting for deflagrations, stable and unstable detonations.

The speed of incoming detonations is greatly reduced by the effective shock absorber (1). This improves the flame extinction 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 conditions of use.

By indicating the operating parameters such as the temperature, pressure and 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 MESG ≥ 0.65 mm).

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

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

Special Features and Advantages

- offers protection against deflagrations, stable and unstable detonations
- less number of FLAMEFILTER® discs from the use of the effective shock absorber
- modular flame arrester unit enables each individual FLAMEFILTER® discs to be replaced and cleaned
- different series allow increase of FLAMEFILTER® size for given flange connection resulting in lower pressure drop across the device
- service-friendly design
- also available for large nominal sizes
- expanded application range for higher operating temperatures and pressures
- bidirectional operation as well as any direction of flow and installation position
- Possible installation of temperature sensors
- minimum pressure loss and associated low operating and life-cycle cost
- cost efficient spare parts

Design Types and Specifications

There are three different designs available:

Basic in-line detonation flame arrester	DA-CG- <input type="checkbox"/>
In-line detonation flame arrester with integrated temperature sensor* as additional protection against short time burning from one side	DA-CG- <input type="checkbox"/>
Detonation arrester with two integrated temperature sensors* as additional protection against short time burning from both sides	DA-CG- <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 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 / 11.18	580 / 22.83	715 / 28.15	840 / 33.07	1025 / 40.35	1025 / 40.35	1255 / 49.41	1485 / 58.46
b	650 / 25.59	650 / 25.59	700 / 27.56	800 / 31.50	900 / 35.43	1100 / 43.31	1250 / 49.21	1500 / 59.06	1500 / 59.06	1700 / 66.93	2000 / 78.74
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	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	

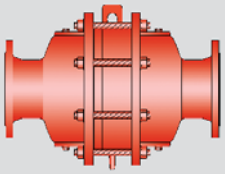
Table 3: Selection of max. operating pressure

		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"
Expl. Gr.	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	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	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
-	Designation	

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	

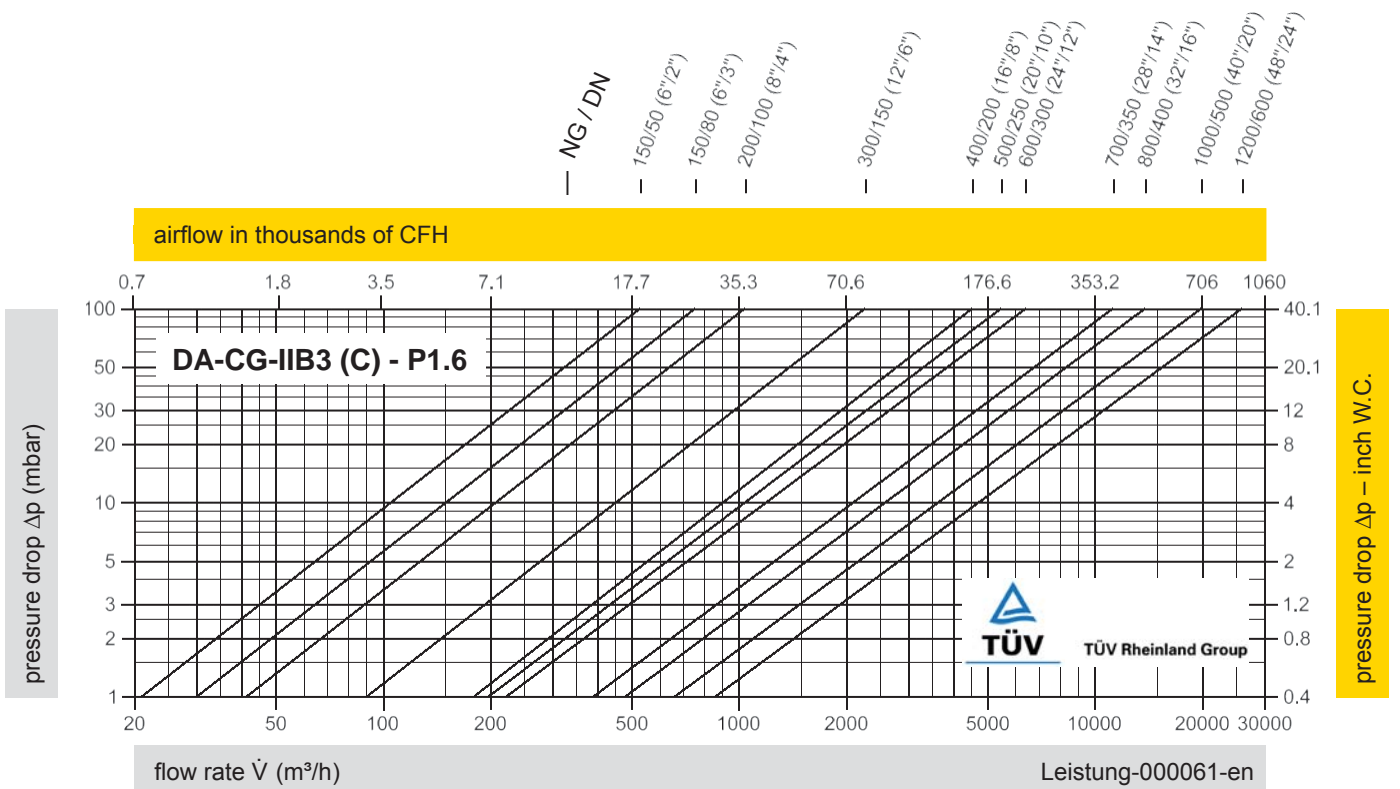
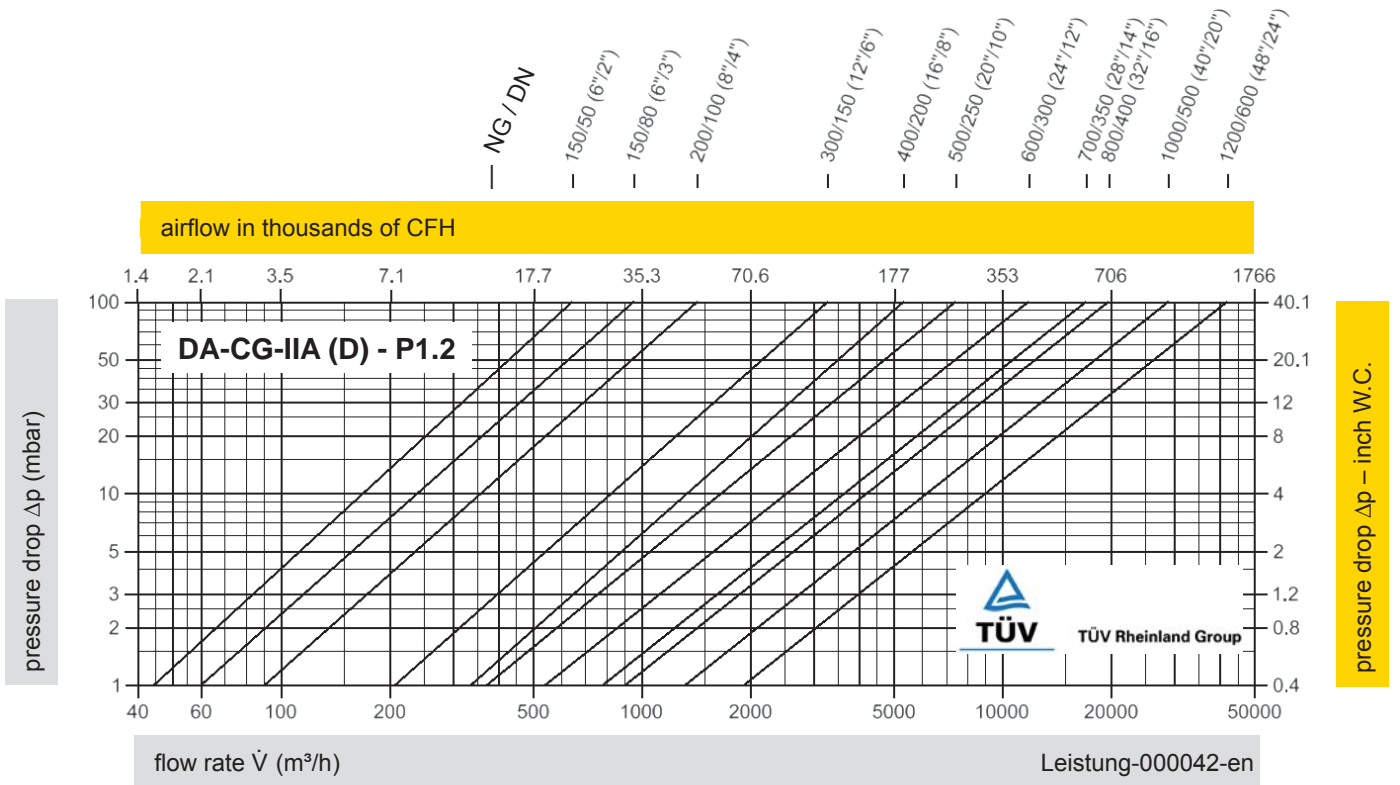
Table 6: Material combinations of the flame arrester unit

Design	A	B	*the FLAMEFILTER® are also available in the materials 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; 150 lbs RFSF	



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 ISO 6358 (20°C, 1bar).

Conversion to other densities and temperatures refer to Vol. 1: "Technical Fundamentals".



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