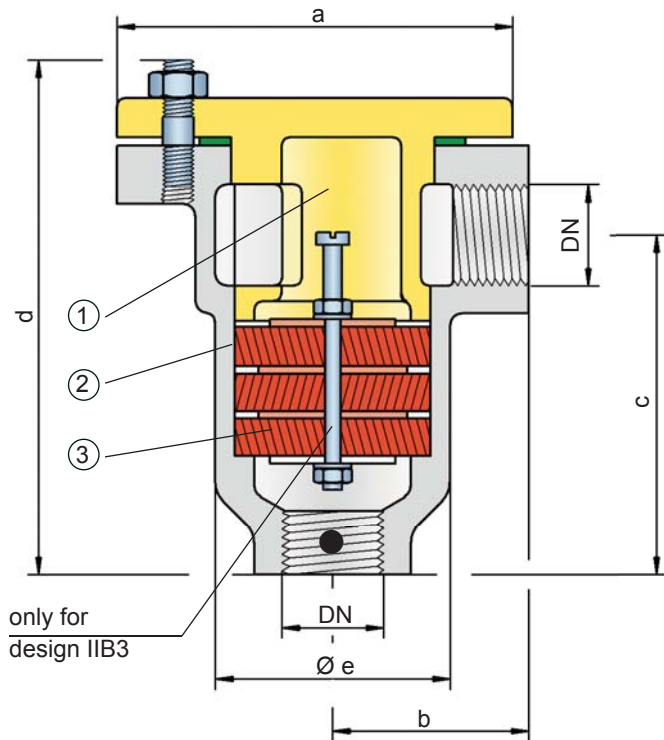


## In-Line Detonation Flame Arrester

for stable detonations and deflagrations in right angle design,  
unidirectional

**PROTEGO® DR/ES**



● Connection to the protected side

### Function and Description

The PROTEGO® DR/ES series in-line detonation flame arrester with connection size up to 3/4" is ideal for installation in small pipes and to protect equipment such as gas analyzers. The device protects against deflagrations and stable detonations. It can be installed anywhere in the pipe no matter what the distance is from the potential ignition source. The small and compact flame arrester has a right angle design.

Once a detonation enters the flame arrester, energy is absorbed from the detonation shock wave by diversion mainly through the shock absorber (1) before the flame is extinguished in the narrow gaps of the FLAMEFILTER® (3).

The PROTEGO® flame arrester unit (2) consists of several FLAMEFILTER® discs and spacers (for explosion group IIC - NEC group B) whose gap size and number is determined by the operating parameters of the processed fluid (explosion group, pressure, temperature). This device is available for explosion groups IIB3 and IIC (NEC group C MESH  $\geq 0.65$  mm and B).

This in-line detonation flame arrester functions unidirectional and is equipped with a threaded connection. The thread can be adapted to international standards. The standard design is approved at an operating temperature up to +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.

Type-approved in accordance with the current ATEX Directive and EN ISO 16852 as well as other international standards.

### Special Features and Advantages

- compact design
- minimum number of FLAMEFILTER® discs due to shock absorber technology and optimal geometry
- Design for IIB3:
  - the device can be serviced without disconnecting the pipe
  - the individual FLAMEFILTER® can be quickly removed and installed
- provides protection from deflagration and stable detonation
- through right angle design no pipe elbows are needed
- works for nearly any flammable gas and gas mixture
- low life-cycle cost
- cost efficient spare parts

**Table 1: Dimensions**

Dimensions in mm / inches

To select the nominal size (DN), please use the flow capacity charts on the following pages

DN	G ¼	G ½	G¾
a	48 / 1.89	70 / 2.76	80 / 3.15
b	35 / 1.38	40 / 1.57	47 / 1.85
c	70 / 2.76	75 / 2.95	87 / 3.43
d	108 / 4.25	115 / 4.53	135 / 5.31
e	34 / 1.34	50 / 1.97	60 / 2.36

**Table 2: Selection of the explosion group**

MESG	Expl. Gr. (IEC/CEN)	Gas Group (NEC)	Special approvals upon request
≥ 0,65 mm	IIB3	C	
< 0,50 mm	IIC	B	

**Table 3: Selection of max. operating pressure**

Expl. Gr.	DN	G¼	G ½	G¾	P <sub>max</sub> = maximum allowable operating pressure in bar / psi (absolute), higher operating pressure upon request Expl. Gr. IIB3 covers Expl. Gr. IIA
	IIB3	P <sub>max</sub>	1.2 / 17.4	1.2 / 17.4	
IIC	P <sub>max</sub>	1.1 / 15.9	1.1 / 15.9	1.1 / 15.9	

**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	B	C	D	G ¼ only comes in design C and D * G ¼ without shock absorber
Housing	Steel	Stainless Steel	Hastelloy	
Cover with shock absorber*	Steel	Stainless Steel	Hastelloy	
Gasket	PTFE	PTFE	PTFE	
Flame arrester unit	A	A	B	

Special materials upon request

**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® *	Stainless Steel	Hastelloy	
Spacer	Stainless Steel	Hastelloy	

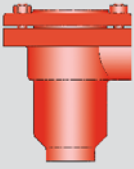
Special materials upon request

**Table 7: Type of connection**

Pipe thread DIN ISO 228-1	DIN	other types of thread upon request
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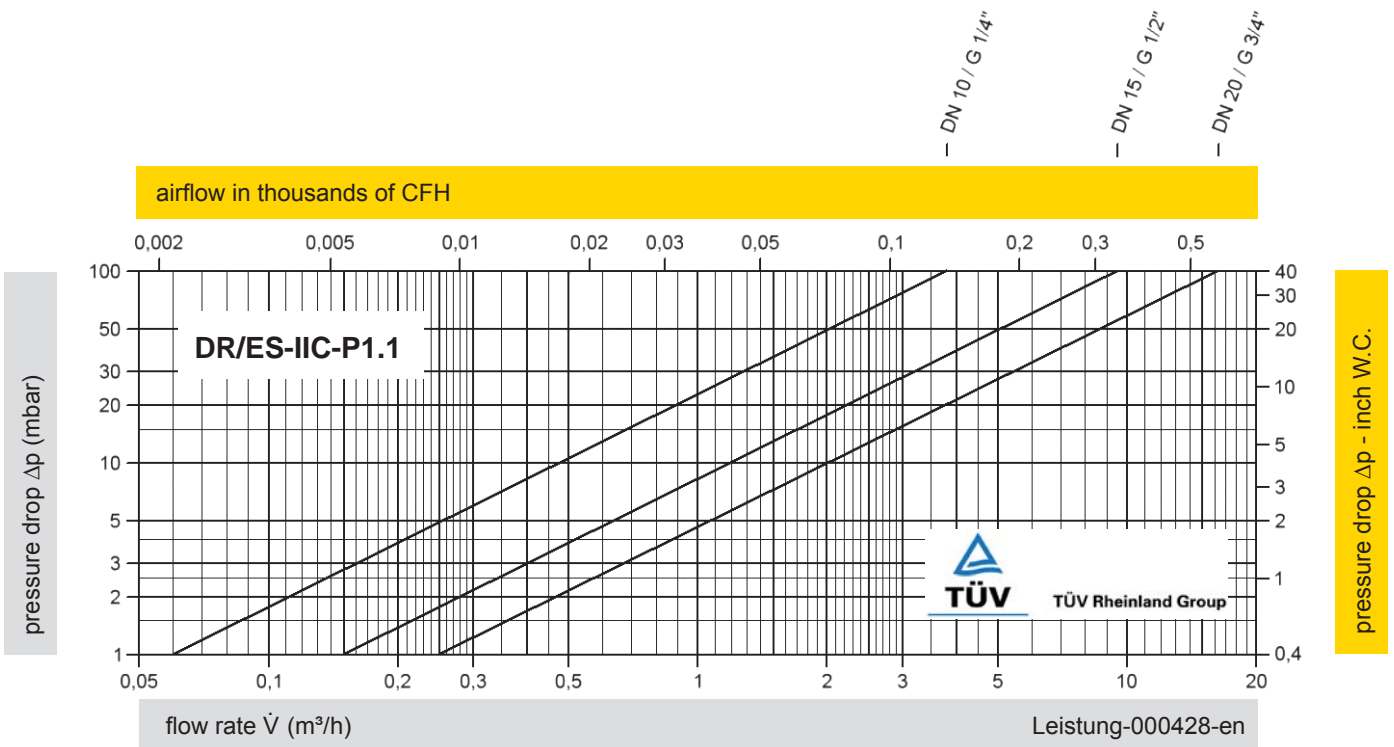
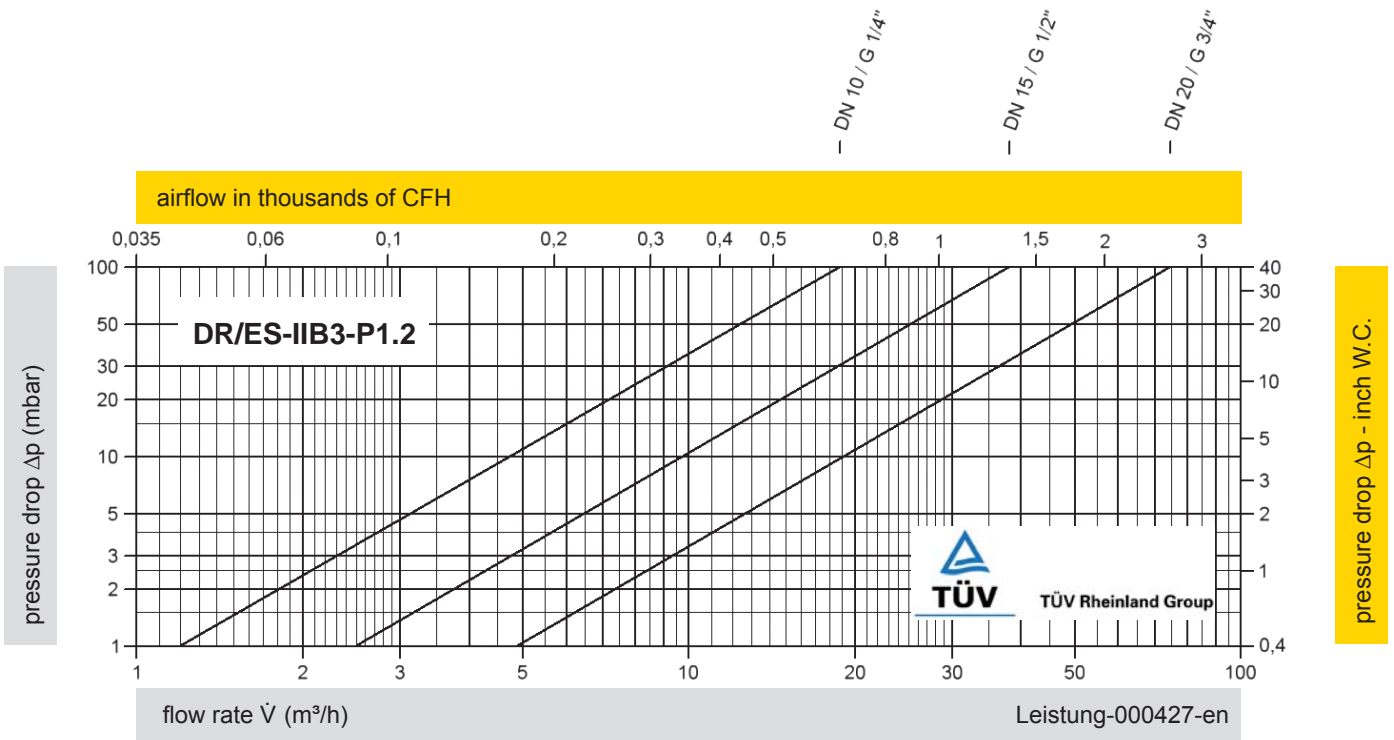
for safety and environment



# In-Line Detonation Flame Arrester

## Flow Capacity Charts

### PROTEGO® DR/ES



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 ISO 6358 (20°C, 1bar). Conversion to other densities and temperatures refer to Vol. 1: "Technical Fundamentals".