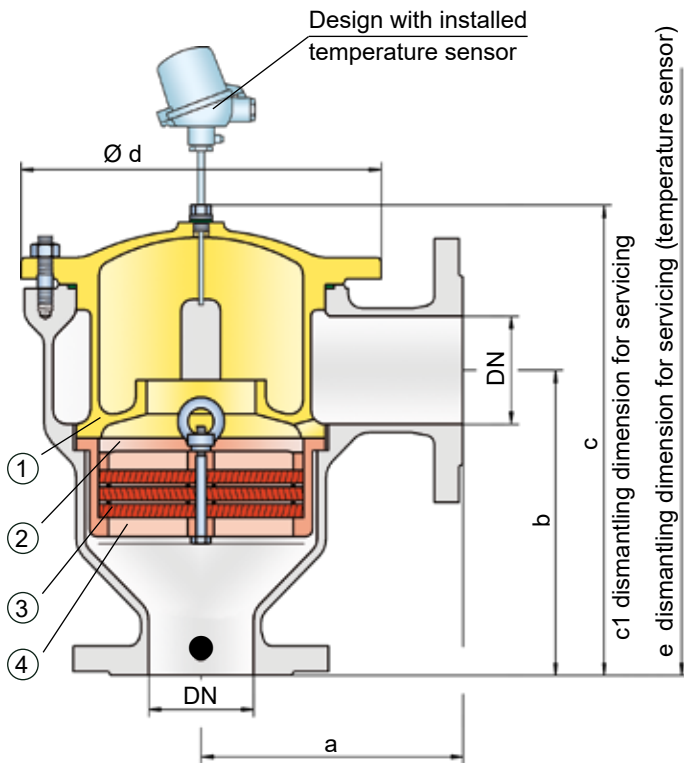


## In-Line Detonation Flame Arrester

for unstable and stable detonations, and deflagrations in right angle design with a shock absorber, uni-directional

**PROTEGO® DR/EU**



● Connection to the protected side

### Function and Description

The PROTEGO® DR/EU series of in-line detonation flame arresters represents further development of PROTEGO® flame arrester series DR/ES, which has been successfully used in industry for decades.

The device protects against deflagrations and stable and unstable detonations. The classic right-angle design offers considerable costs and maintenance advantages over the straight-through design.

Once a detonation enters the flame arrester, energy is absorbed from the detonation shock wave by the integrated 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 firmly held in the FLAMEFILTER® casing (4). The gap size and number of FLAMEFILTER® discs are by the operating conditions of the flowing mixture (explosion group, pressure, temperature). This device is can be used for explosion groups from IIA to IIB3 (NEC group D to C MESG ≥ 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 temperatures are available 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

- low number of FLAMEFILTER® discs due to shock absorber technology
- quick removal and installation of the complete PROTEGO® flame arrester and the individual FLAMEFILTER® in the casing
- modular design enables replacement of the individual FLAMEFILTER® discs
- provides protection against deflagrations and stable and unstable detonations
- right-angle design eliminates need for pipe elbows
- advanced design for higher operating temperatures and pressures
- low pressure loss results in low operating and lifecycle costs
- cost-effective spare part

### Design Types and Specifications

There are four different designs available:

Basic in-line detonation flame arrester	DR/EU-	-	-
In-line detonation flame arrester with integrated temperature sensor* as additional protection against short-time burning	DR/EU-	T	-
In-line detonation flame arrester with heating jacket	DR/EU-	H	-
in-line detonation flame arrester with integrated temperature sensor* and heating jacket	DR/EU-	H	- T

\*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"
a	125/4.92	125/4.92	153/6.02	155/6.10	198/7.80	200/7.87	250/9.84	332/13.07	335/13.19
b	140/5.51	140/5.51	183/7.20	185/7.28	223/8.78	225/8.86	290/11.42	357/14.06	360/14.17
c	210/8.27	210/8.27	290/11.42	290/11.42	365/14.37	365/14.37	440/17.32	535/21.06	535/21.06
c1	285/11.22	285/11.22	395/15.55	395/15.55	500/19.69	500/19.69	595/23.43	750/29.53	750/29.53
d	150/5.91	150/5.91	210/8.27	210/8.27	275/10.83	275/10.83	325/12.80	460/18.11	460/18.11
e	495/19.49	495/19.49	600/23.62	600/23.62	705/27.76	705/27.76	795/31.30	950/37.40	950/37.40

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

MESG	Expl. Gr. (IEC/CEN)	Gas Group (NEC)	Special approvals upon request.
> 0,90 mm	IIA	D	
≥ 0,75 mm	IIB2	C	
≥ 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"
Expl. Gr.	IIA	P <sub>max</sub>	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.5 / 21.7	1.2 / 17.4	1.2 / 17.4
	IIB2	P <sub>max</sub>							1.4 / 20.3	1.4 / 20.3
	IIB3	P <sub>max</sub>	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.6 / 23.2	1.4 / 20.3	1.2 / 17.4*

P<sub>max</sub> = maximum allowable operating pressure in bar / psi (absolute); higher operating pressure upon request.

\* special flame arrester unit

**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	B	C	D	*For devices exposed to elevated temperatures above 150°C / 302°F, gaskets are made of PTFE.  The housing and cover with the shock absorber can also be delivered in steel with an ECTFE coating.
Housing	Carbon Steel	Stainless Steel	Hastelloy	
Heating jacket (DR/EU-H-(T)-...)	Steel	Stainless Steel	Stainless Steel	
Cover with shock absorber	Steel	Stainless Steel	Hastelloy	
O-Ring	FPM *	PTFE	PTFE	
Flame arrester unit	A	C, D	E	

Special materials upon request.

**Table 6: Material combinations of the flame arrester unit**

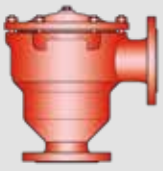
Design	A	C	D	E	*The FLAMEFILTER® is also available in Tantalum, Inconel, Copper, etc., when the listed housing and casing materials are used.
FLAMEFILTER® casing	Steel	Stainless Steel	Stainless Steel	Hastelloy	
FLAMEFILTER® *	Stainless Steel	Stainless Steel	Hastelloy	Hastelloy	
Spacer	Stainless Steel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

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.	

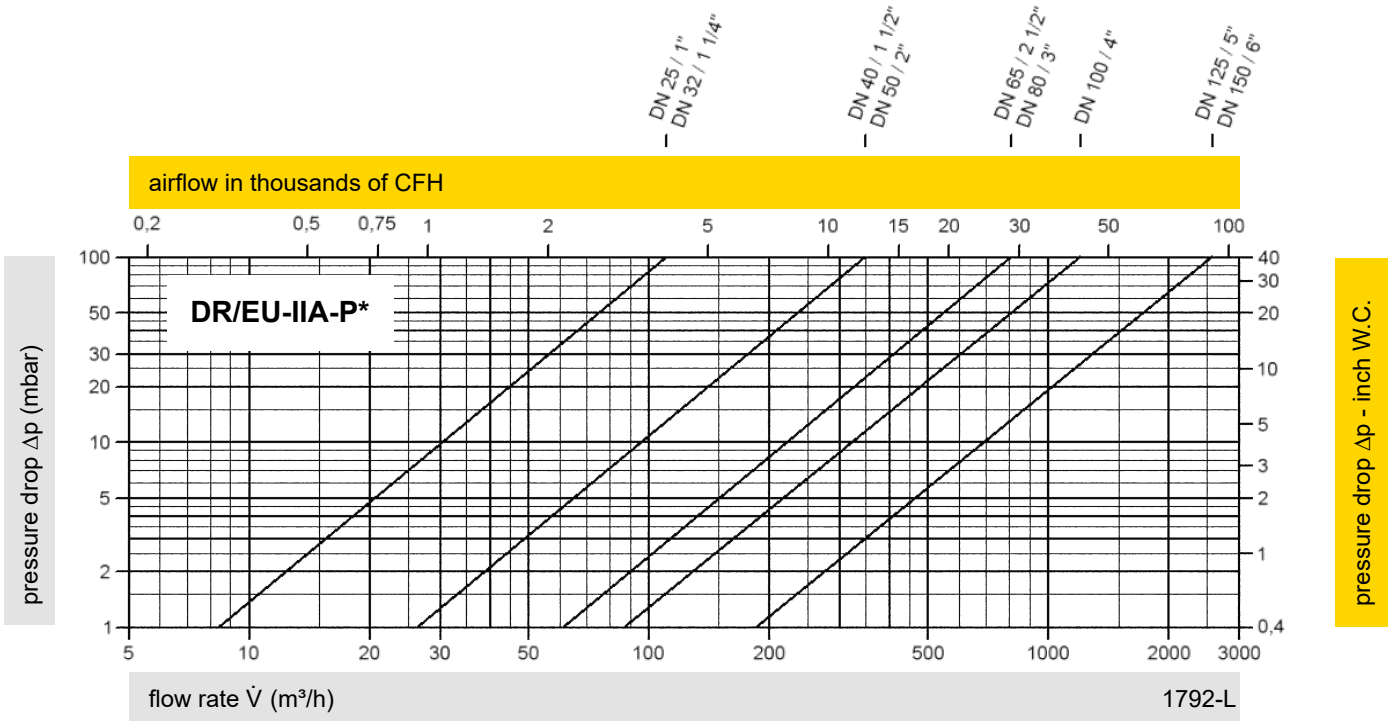




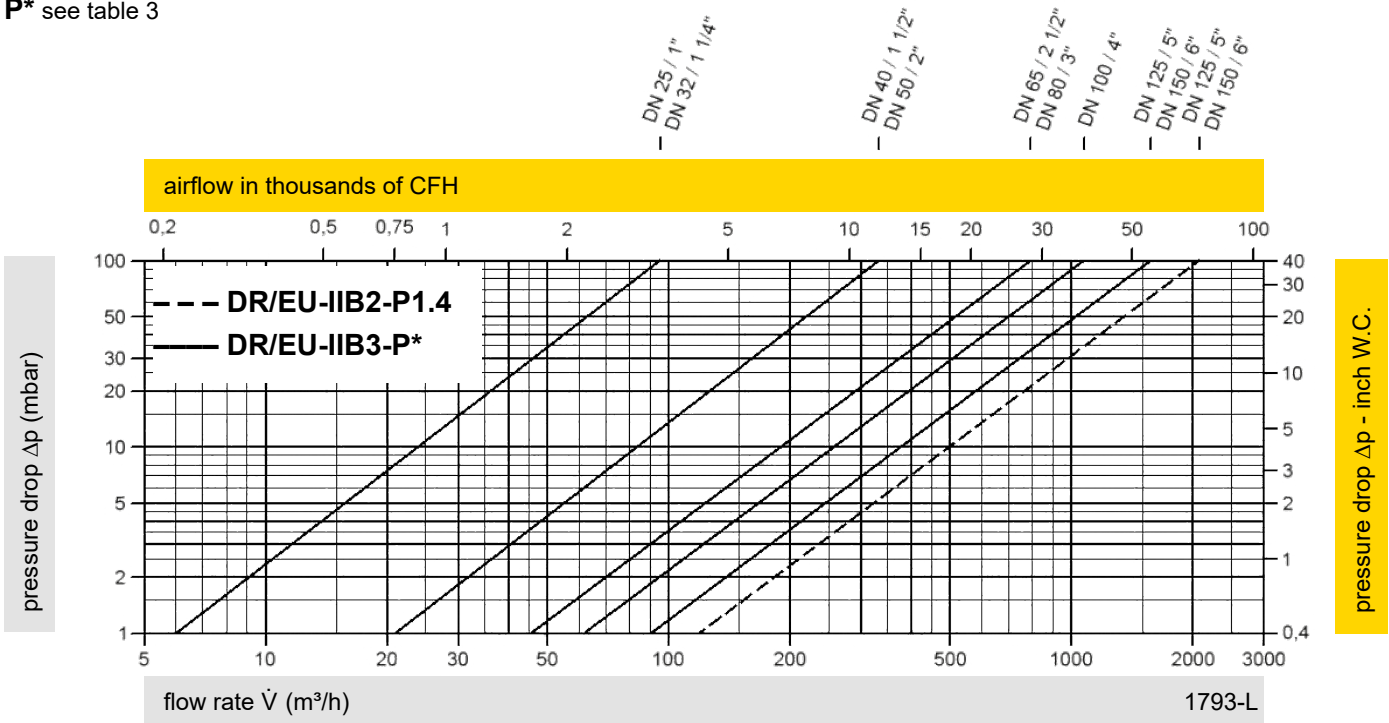
# In-Line Detonation Flame Arrester

## Flow Capacity Charts

### PROTEGO® DR/EU



P\* see table 3



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 in ISO 6358 (20°C, 1bar). For conversion to other densities and temperatures, refer to Sec. 1: "Technical Fundamentals."