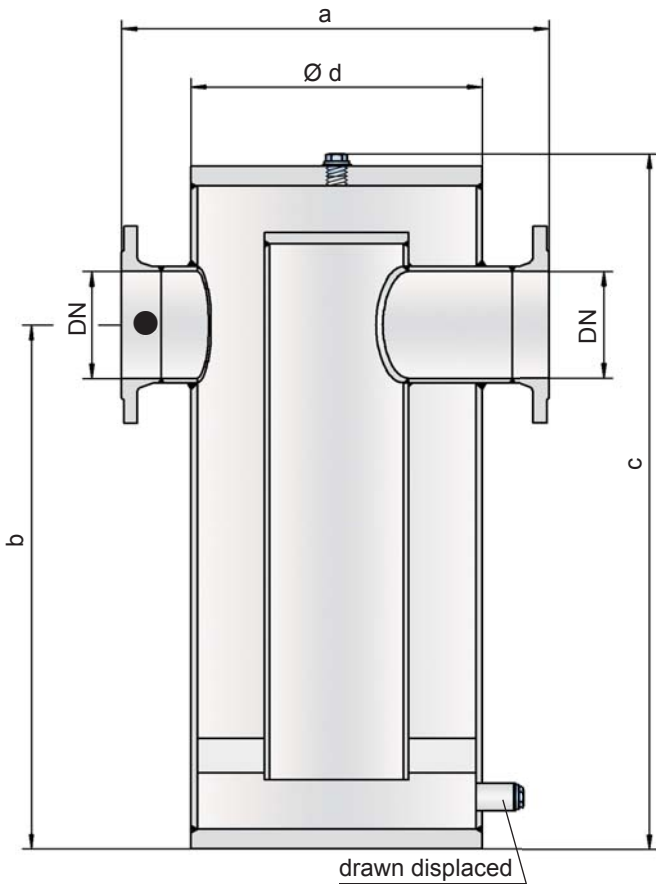




In-Line Liquid Detonation Flame Arrester

for filling lines - external installation

PROTEGO® LDA-W



● Tank connection / protected side

Function and Description

The PROTEGO® LDA-W liquid detonation flame arrester was developed for storage container filling lines that are not continuously filled with product and sometimes contain a combustible mixture. The device is installed outside of the container in the filling line. If the explosive atmosphere is ignited, the device prevents the combustion from traveling into the tank. The PROTEGO® LDA-W series of liquid detonation flame arresters functions according to the siphon principle in which the liquid product serves as a barrier against flame propagation.

When a highly accelerated pipe deflagration or detonation occurs, the combustion pressure and flame propagation speed is first substantially reduced by the construction and converted into a low-energy deflagration that is then stopped by the remaining immersion liquid.

The application range for the device is a product vapour/air mixture temperature up to +60°C / 140°F and an absolute pressure up to 1.1 bar / 15.9 psi. This covers all of the possible operating conditions of empty lines for flammable liquids. The liquid detonation arrester is designed for pressures up to 10 bar / 145 psi and therefore resists explosion pressure offering protection for almost all flammable liquids. The device is approved for explosion groups IIA to IIB3 (NEC group D to C MESH ≥ 0.65 mm). Special designs with a cleaning cover for highly viscous and contaminated liquids can be provided.

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

Special Features and Advantages

- the device is easily accessible since it is mounted on the containers outside
- minimum risk of soiling
- low pressure loss
- provides protection from deflagrations and stable detonations
- useful for nearly all flammable liquids
- meets TRbF* requirements
- maintenance friendly design also useable as strainer

*TRbF = technical regulations for flammable liquids

Table 1: Dimensions

Dimensions in mm / inches

To select the nominal size (DN), please use the flow capacity chart 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"	200 8"	250 10"	300 12"
a	250 / 9.84	275 / 10.83	350 / 13.78	350 / 13.78	450 / 17.72	450 / 17.72	500 / 19.69	600 / 23.62	600 / 23.62	700 / 27.56	850 / 33.46	1000 / 39.37
b	325 / 12.80	360 / 14.17	420 / 16.54	420 / 16.54	540 / 21.26	540 / 21.26	595 / 23.43	915 / 36.02	915 / 36.02	1100 / 43.31	1325 / 52.17	1480 / 58.27
c	445 / 17.52	480 / 18.90	565 / 22.24	565 / 22.24	720 / 28.35	720 / 28.35	800 / 31.50	1265 / 49.80	1265 / 49.80	1520 / 59.84	1830 / 72.05	2050 / 80.71
d	140 / 5.51	140 / 5.51	195 / 7.68	195 / 7.68	275 / 10.83	275 / 10.83	325 / 12.80	460 / 18.11	460 / 18.11	510 / 20.08	610 / 24.02	700 / 27.56

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: Specification of max. operating temperature

≤ 60°C / 140°F	Tmaximum allowable operating temperature in °C	
-	Designation	higher operating temperatures upon request

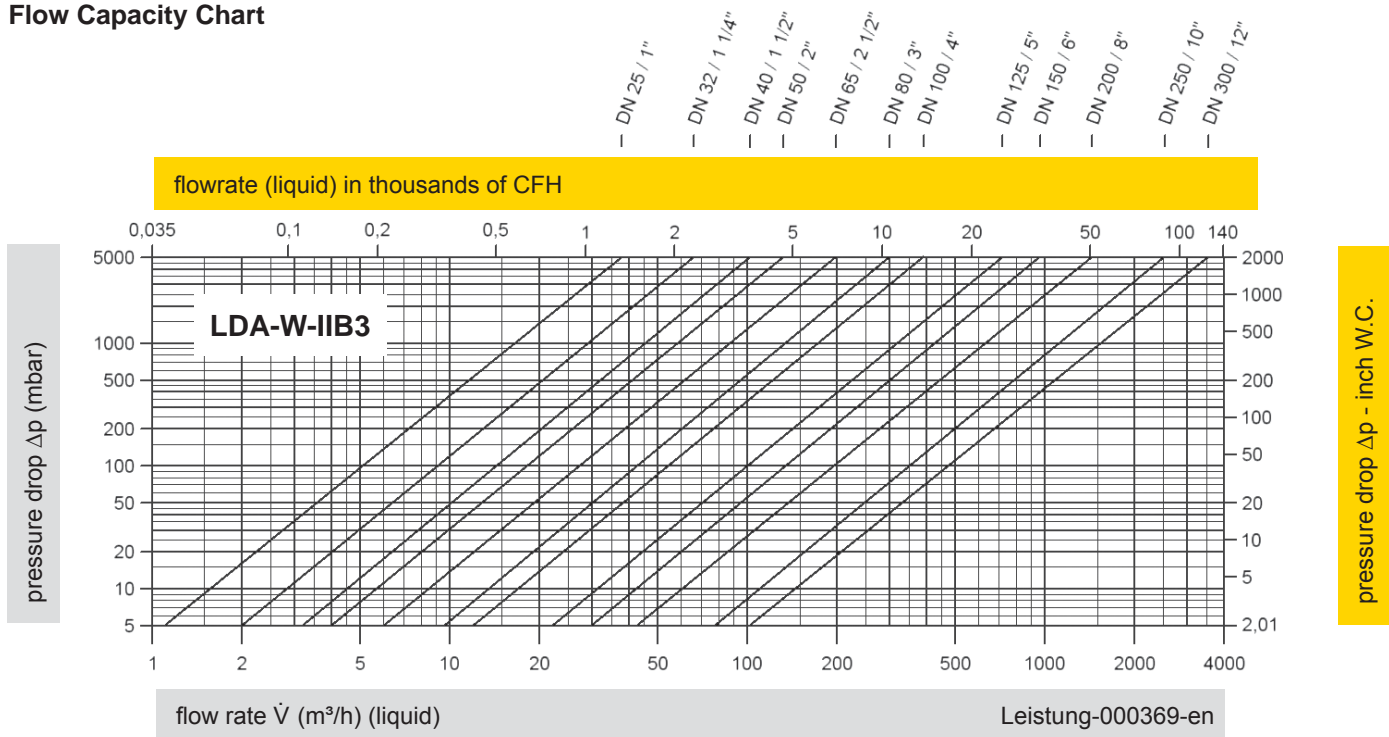
Table 4: Material selection for housing

Design	A	B	C	
Housing	Steel	Stainless Steel	Hastelloy	Special materials upon request
Gasket	PTFE	PTFE	PTFE	

Table 5: Flange connection type

EN 1092-1; Form B1	other types upon request
ASME B16.5; 150 lbs RFSF	

Flow Capacity Chart



Conversion: $\dot{V}_{liquid} = \dot{V}_{water} * \sqrt{\frac{\rho_{water}}{\rho_{liquid}}}$

The volume flow \dot{V} in m³/h was determined with water according to DIN EN 60534 at a temperature $T_n = 15^\circ\text{C}$ and an atmospheric pressure $p_n = 1,013 \text{ bar}$, kinematic viscosity $\nu = 10^{-6} \text{ m}^2/\text{s}$.

To avoid electrostatic charge of flammable liquids the maximum flow is limited (refer to BG-Regulation 132, CENELEC-Report CLC/TR 50404).



for safety and environment