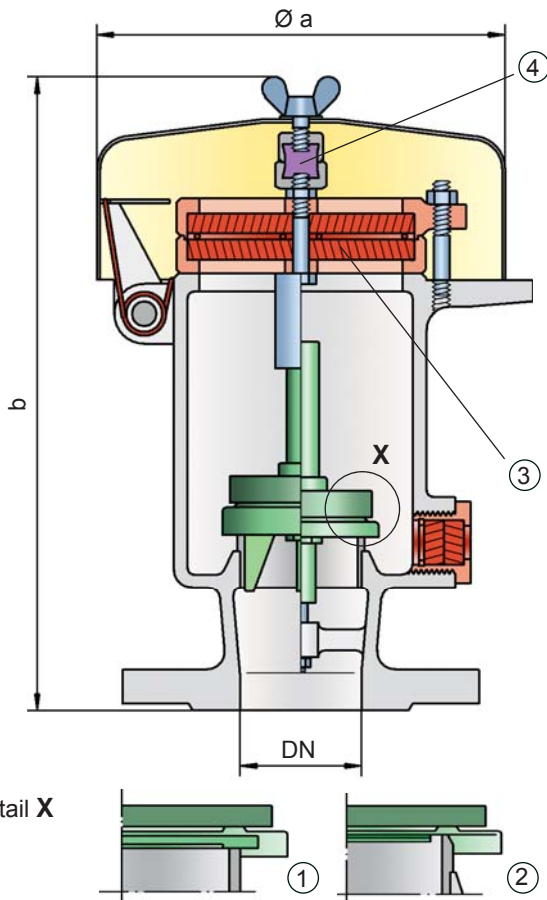


# Pressure Relief Valve

deflagration- and endurance burning-proof



## PROTEGO® P/EB



sured by the valve seats made of high quality stainless steel and with individually lapped valve pallets (1) or with an air cushion seal (2) in conjunction with a high quality FEP diaphragm. The valve pallets are also available with a PTFE seal to prevent the valve pallets from sticking when sticky products are used and to enable the use in corrosive fluids. After the excess pressure is discharged, the valve reseats and provides a tight seal.

If the set pressure is exceeded, explosive gas/product-vapour air mixtures are released to the atmosphere. If this mixture ignites, the integrated PROTEGO® flame arrester unit (3) prevents flame transmission into the tank. If additional mixture continues to flow and stabilized burning occurs, the integrated flame arrester unit prevents flashback as a result from endurance burning. The valve is protected and also fulfils its function under this severe service conditions. The spring loaded weather hood opens as soon as the fusible element (4) melts.

The valve can be used up to an operating temperature of +60°C / 140°F and meets the requirements of European tank design standard EN 14015 – Appendix L and ISO 28300 (API 2000).

Type-approved in accordance with the current ATEX Directive and EN 12874 as well as other international standards.

### Special Features and Advantages

- requires only 10% overpressure to full lift
- through 10% technology higher set pressures can be used which results in product loss reduction compared to conventional 40% and 100% overpressure technology vents (compare API 2000)
- more design flexibility through higher reseating pressures; vents reseal when conventional vent is still discharging costly product or nitrogen
- high performance seal reducing product loss below EPA's 500ppm rule preventing environmental pollution
- the valve disc is guided within the housing to protect against harsh weather conditions
- can be used as protective system according ATEX in areas subject to explosion hazards
- PROTEGO® flame arrester unit provides protection against atmospheric deflagration and endurance burning
- flame arrester unit integrated into the valve saves space, weight and reduces cost
- flame arrester unit protected from clogging through product vapour
- flame arrester unit has a low pressure drop
- flame transmission proof condensate drain
- maintenance friendly design
- modular design enables individual FLAMEFILTER® and valve pallet to be replaced

### Pressure settings:

+3.5 mbar up to +210 mbar  
 +1.4 inch W.C. up to +84 inch W.C.  
 Higher pressure settings upon request.

### Function and Description

The deflagration-proof and endurance burning-proof P/EB type PROTEGO® valve is a highly developed pressure relief valve with an integrated flame arrester unit. It is primarily used as a safety device for flame transmission proof outbreathing on tanks, containers and process engineering apparatus. The valve offers reliable protection against excess pressure and prevents product losses almost up to the set pressure; it also protects against atmospheric deflagration as well as endurance burning if stabilized burning occurs. The PROTEGO® flame arrester unit is designed to achieve minimum pressure drop with maximum safety. The P/EB valve is available for substances of explosion group IIA (NEC group D MESH > 0.90 mm).

When the set pressure is reached, the valve starts to open and reaches full lift within 10% overpressure. This unique 10% technology enables a set pressure that is only 10% below the maximum allowable working pressure (MAWP) of the tank. After years of development, this typical opening characteristic of a safety relief valve is now also available for the low pressure range.

The tank pressure is maintained up to the set pressure with a tightness that is far superior to the conventional standard due to our state of the art manufacturing technology. This feature is en-



Vents - 10% Technology  
(Flyer pdf)



Leak Rate/10% Technology  
(Flyer pdf)



Demonstration of endurance burning  
Video

## Design Types and Specifications

The valve disc is weight-loaded. At set pressure >80 mbar (32.1 inch W.C.), an elongated design is used

There are two different designs:

Pressure relief valve, basic design

P/EB -

Pressure relief valve with heating jacket

P/EB -

(max. heating fluid temperature +85°C / 185°F)

Additional special devices available upon request

**Table 1: Dimensions**

Dimensions in mm / inches

To select the nominal size (DN), please use the flow capacity chart on the following page

DN	50 / 2"	50 / 2"	80 / 3"	80 / 3"
Set pressure	≤ +80 mbar ≤ +32.1 inch W.C.	> +80 mbar > +32.1 inch W.C.	≤ +80 mbar ≤ +32.1 inch W.C.	> +80 mbar > +32.1 inch W.C.
a	218 / 8.58	218 / 8.58	218 / 8.58	218 / 8.58
b	287 / 11.30	452 / 17.80	289 / 11.38	454 / 17.87

Dimensions for Pressure Relief Valve with heating jacket upon request

**Table 2: Selection of explosion group**

MESG	Expl. Gr. (IEC/CEN)	Gas Group (NEC)	Special approvals upon request
> 0,90 mm	IIA	D	

**Table 3: Material selection for housing**

Design	B	C	Special materials upon request
Housing	Steel	Stainless Steel	
Heating jacket (P/EB-H-...)	Steel	Stainless Steel	
Valve seat	Stainless Steel	Stainless Steel	
Weather hood	Steel	Stainless Steel	

**Table 4: Material combination of flame arrester unit**

Design	A	Special materials upon request
FLAMEFILTER® cage	Stainless Steel	
FLAMEFILTER®	Stainless Steel	
Spacer	Stainless Steel	

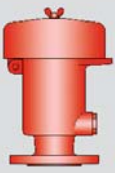
**Table 5: Material selection for valve pallet**

Design	A	B	C	D	Special materials and higher pressure settings upon request
Pressure range (mbar)	+3.5 up to +5.0	>+5.0 up to +14	>+14 up to +210	>+14 up to +210	
(inch W.C.)	+1.4 up to +2.0	>+2.0 up to +5.6	>+5.6 up to +84	>+5.6 up to +84	
Valve pallet	Aluminium	Stainless Steel	Stainless Steel	Stainless Steel	
Sealing	FEP	FEP	Metal to Metal	PTFE	

**Table 6: Flange connection type**

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

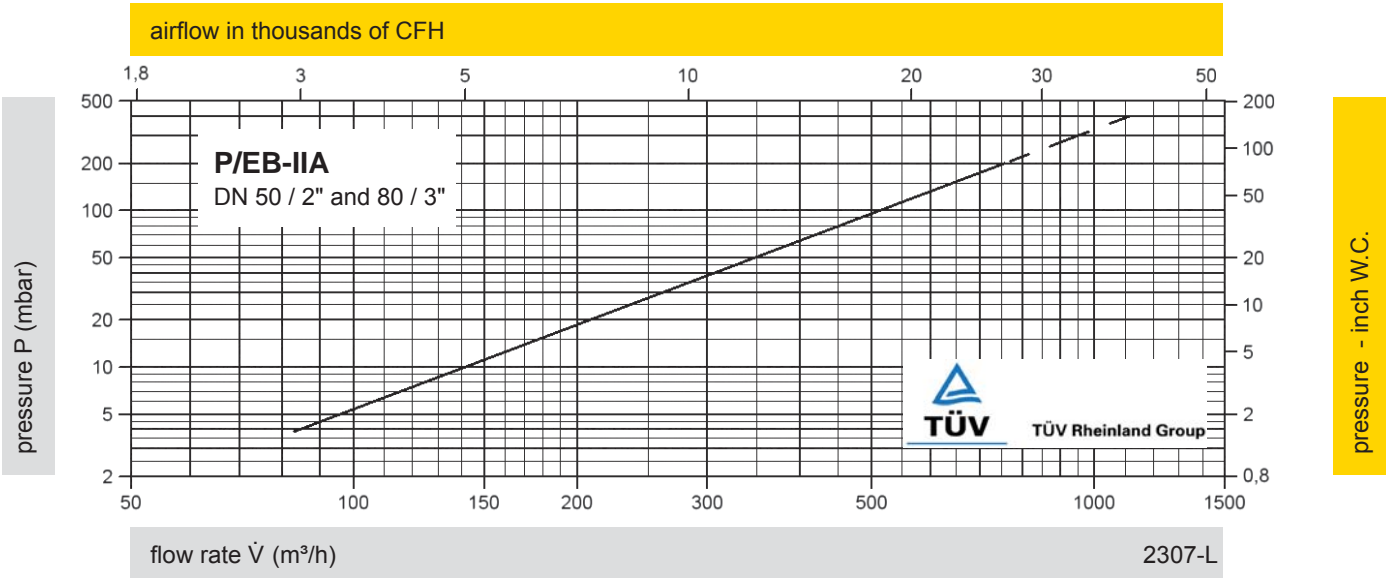




# Pressure Relief Valve

## Flow Capacity Chart

### PROTEGO® P/EB



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".