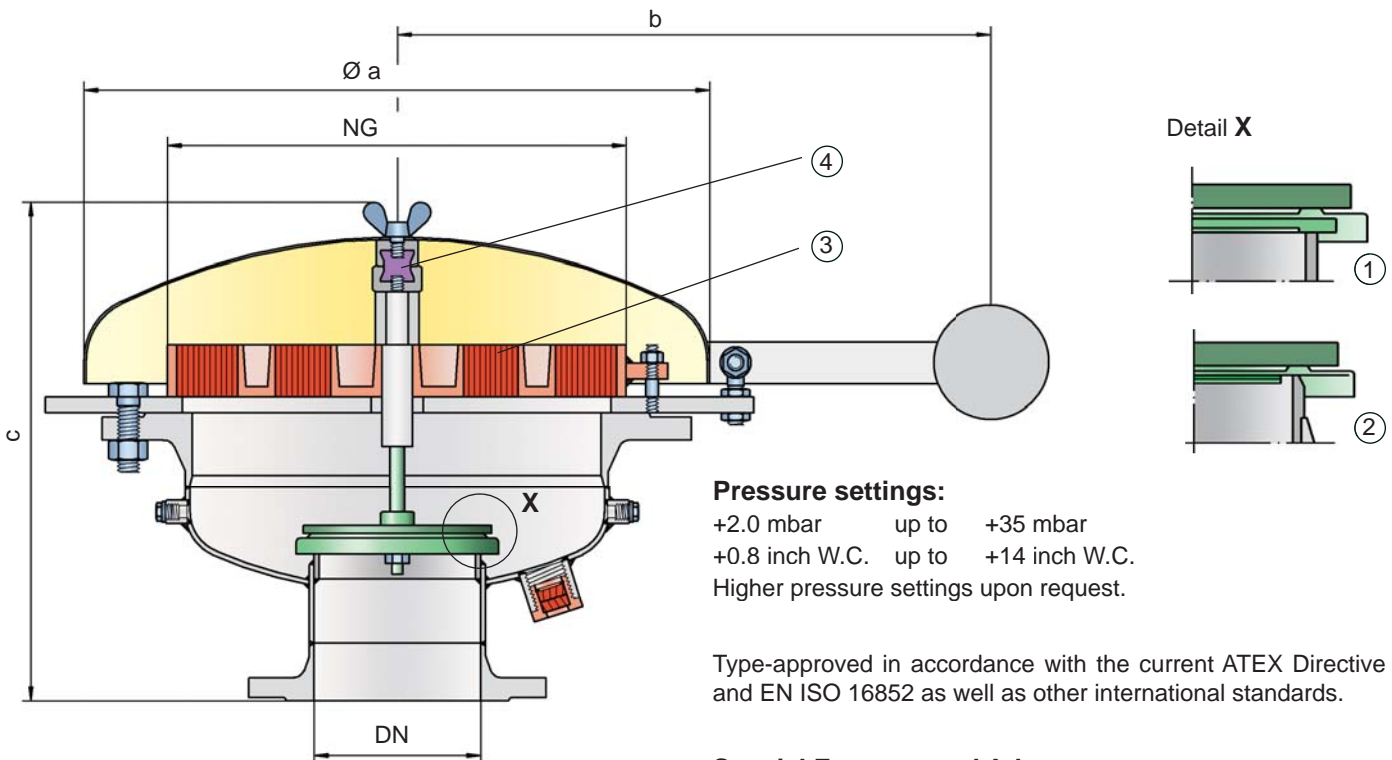


Pressure Relief Valve

deflagration- and endurance burning-proof

PROTEGO® BE/HR-D



Pressure settings:

+2.0 mbar up to +35 mbar
 +0.8 inch W.C. up to +14 inch W.C.
 Higher pressure settings upon request.

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

Function and Description

The deflagration-proof and endurance burning-proof BE/HR-D 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 BE/HR-D valve is available for substances of explosion group IIA (NEC group D MESH > 0.9 mm).

When the set pressure is reached, the valve starts to open and reaches full lift within 40% overpressure. 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 ensured 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 high quality FEP diaphragm. 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).

Special Features and Advantages

- requires only 40% overpressure to full lift
- through 40% technology higher set pressures can be used which results in product loss reduction compared to conventional 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 to ATEX in areas subject to explosion hazards
- high flow capacity through large FLAMEFILTER® cross-section, results in low pressure drop
- FLAMEFILTER® provides protection against atmospheric deflagration and endurance burning
- FLAMEFILTER® integrated into the valve saves space, weight and reduces cost
- FLAMEFILTER® protected from clogging through product vapours
- flame-transmission-proof condensate drain
- maintenance-friendly design

Design and Specifications

The valve disc is weight-loaded.

Pressure relief valve, basic design

BE/HR-D-400/...

Additional special devices available upon request



Demonstration of endurance burning
Video

Table 1: Dimensions

Dimensions in mm / inches

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

DN	150 / 6"	200 / 8"	NG = Nominal size
NG	400 / 16"	400 / 16"	
a	600 / 23.62	600 / 23.62	
b	545 / 21.46	545 / 21.46	
c	485 / 19.09	485 / 19.09	

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	A	B	Special materials upon request
Housing	Steel	Stainless Steel	
Valve seat	Stainless Steel	Stainless Steel	
Weather hood	Steel	Stainless Steel	
Flame arrester unit	A	B	

Table 4: Material combinations of flame arrester unit

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

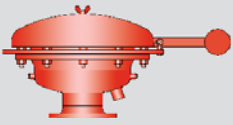
Table 5: Material selection for valve pallet

Design	A	B	C	Special materials and higher pressure settings upon request
Pressure range (mbar) (inch W.C.)	+2.0 up to +3.5 +0.8 up to +1.4	>+3.5 up to +14 >+1.4 up to +5.6	>+14 up to +35 >+5.6 up to +14	
Valve pallet	Aluminium	Stainless Steel	Stainless Steel	
Sealing	FEP	FEP	Metal to Metal	

Table 6: Flange connection type

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



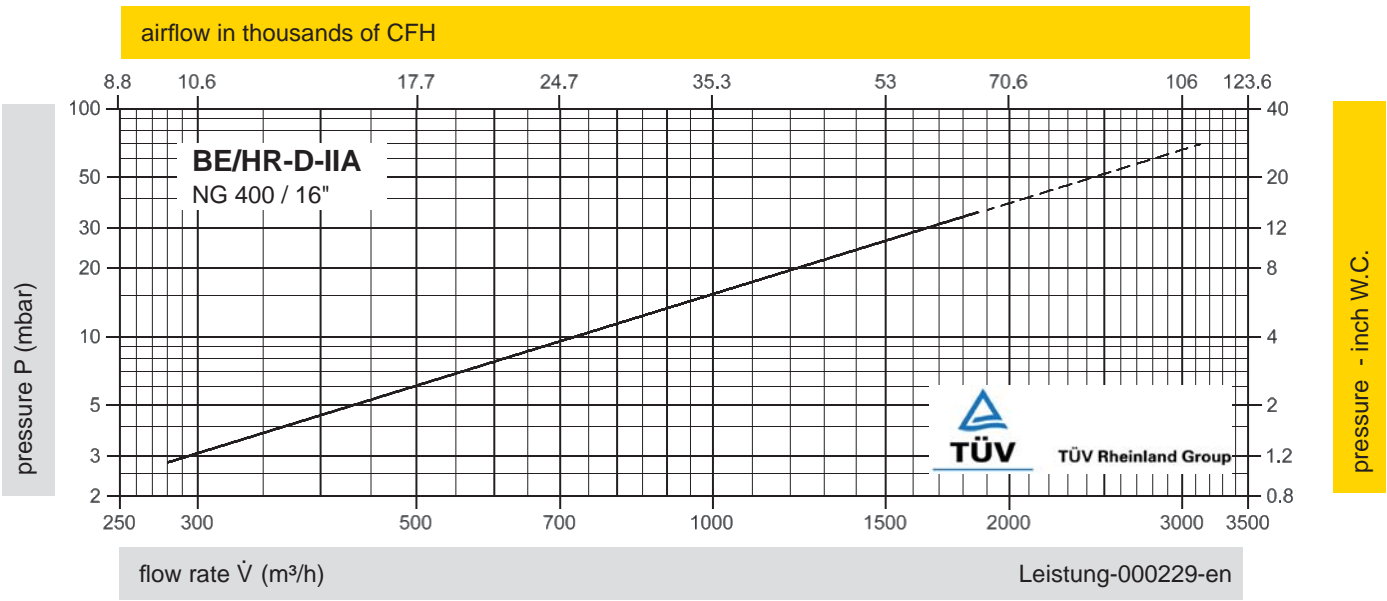


Pressure Relief Valve

Flow Capacity Chart

PROTEGO® BE/HR-D

DN 150 / 6"
DN 200 / 8"



Remark

$$\text{set pressure} = \frac{\text{opening pressure resp. tank design pressure}}{1,4}$$

Set pressure = the valve starts to open

Opening pressure = set pressure plus overpressure

Overpressure = pressure increase over the set pressure

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".