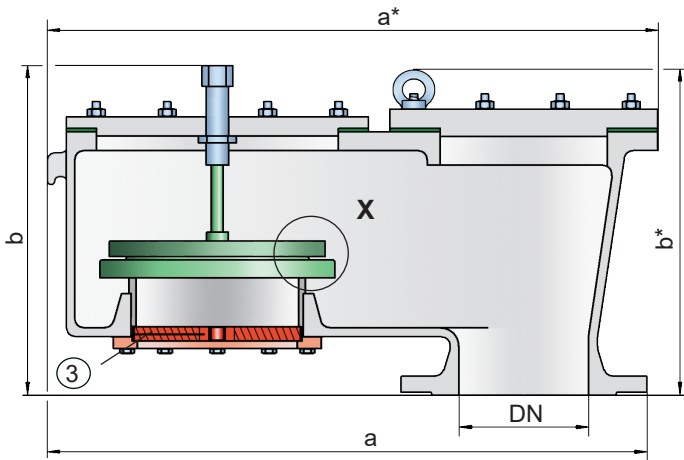


# Vacuum Relief Valve

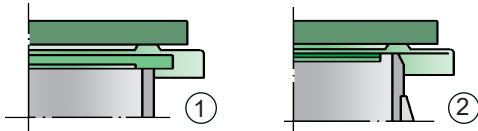
## Atmospheric Deflagration-proof



### PROTEGO® V/SV-AD-IIB3



Detail X



#### Settings:

**vacuum:** -2.0 mbar up to -35 mbar  
 -0.8 inch W.C. up to -14 inch W.C.

Higher and lower settings upon request.

#### Function and Description

The deflagration proof V/SV-AD type PROTEGO® valve is a highly developed vacuum relief valve for high flow capacities with an integrated flame arrester unit. It is primarily used as a safety device for flame-transmission-proof in-breathing in tanks, containers, and process equipment. The valve offers reliable protection against vacuum and prevents in-breathing of air almost up to the set pressure; while at the same time protecting against atmospheric deflagration. The PROTEGO® flame arrester unit is designed to achieve minimum pressure drop with maximum safety. The deflagration-proof PROTEGO® V/SV-AD valve is available for substances for explosion group IIB3 (C MESG ≥ 0.65 mm).

When the set vacuum is reached, the valve starts to open and reaches full lift within 10% overpressure. This unique 10% technology enables a set vacuum that is only 10% above the maximum allowable working vacuum (MAWV) 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 vacuum with a tightness that is above to the normal standards 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. The valve pallets are also available with a PTFE seal to prevent them from sticking when sticky substances are

used and to enable the use of corrosive fluids. After the vacuum is balanced, the valve re-seats and provides a tight seal.

If the valve is used in atmospheres forming an explosive mixture with air and the mixture ignites, the integrated PROTEGO® flame arrester unit (3) prevents flame transmission into the tank. The standard design is tested at an operating temperature of up to +60°C / 140°F and meets the requirements of European tank design standard EN 14015 (Appendix L) and ISO 28300 (API 2000).

EU conformity according to the currently valid ATEX directive. Approvals according to other national/international regulations on request.

#### Special Features and Advantages

- 10% technology for minimum pressure increase up to full lift
- extreme tightness, resulting in lowest possible product losses and reduced environmental pollution
- due to 10% technology, set pressure is close to opening pressure for optimum pressure maintenance in the system as compared to conventional 40% or 100% technology
- valve opens later and closes earlier than conventional valves
- valve pallet is guided inside the housing to protect against harsh weather conditions
- can be used as a protective system in areas with potentially explosive atmospheres in accordance with ATEX
- FLAMEFILTER® provides protection against atmospheric deflagrations
- integrated PROTEGO® flame arrester unit saves space and weight and reduces costs
- PROTEGO® flame arrester unit is protected from clogging and sticky substances caused by product vapors
- minimum pressure loss of the PROTEGO® flame arrester unit
- higher flow capacity
- maintenance-friendly design
- modular design enables replacement of individual FLAMEFILTER® discs and valve pallet
- best possible technology for API tanks

#### Design Typ and Specification

The valve pallet is weight-loaded.

There are two different designs:

Vacuum relief valve, basic design

V/SV-AD

Vacuum relief valve with heating jacket  
 (max. heating fluid temperature +85°C / 185°F)

V/SV-AD-H

Additional special devices available upon request.



Vents - 10% Technology  
(Flyer pdf)



Leak Rate/10% Technology  
(Flyer pdf)

**Table 1: Dimensions**

Dimensions in mm / inches

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

DN	50 / 2"	80 / 3"	100 / 4"	150 / 6"	200 / 8"	250 / 10"	300 / 12"
a	337 / 13.27	395 / 15.55	515 / 20.28	713* / 28.07*	808* / 31.81*	925* / 36.42*	946 / 37.24
b	247* / 9.72*	312 / 12.28	358 / 14.09	443 / 17.44	520 / 20.47	588 / 23.15	588 / 23.15

Dimensions of vacuum relief valves with heating jacket upon request.

**Table 2: Selection of explosion group**

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

**Table 2: Material selection for housing**

Design	A	B	C	
Housing	Aluminum	Steel	Stainless Steel	Option: Housing ECTFE-coated. Special materials upon request.
Heating jacket (V/SV-AD-H-...)	-	Steel	Stainless Steel	
Valve seat	Stainless Steel	Stainless Steel	Stainless Steel	
Sealing	PTFE	PTFE	PTFE	
Cover	Aluminum	Steel	Stainless Steel	
FLAMEFILTER®	Stainless Steel	Stainless Steel	Stainless Steel	

**Table 3: Material selection for vacuum valve pallet**

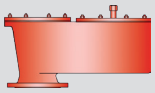
Design	A	B	C	D
Vacuum range (mbar) (inch W.C.)	-2.0 up to -3.5 -0.8 up to -1.4	<-3.5 up to -14 <-1.4 up to -5.6	<-14 up to -35 <-5.6 up to -14	<-14 up to -35 <-5.6 up to -14
Valve pallet	Aluminum	Stainless Steel	Stainless Steel	Stainless Steel
Sealing	FEP	FEP	Metal to Metal	PTFE

Special material as well as higher vacuum upon request.

**Table 7: Flange connection type**

EN 1092-1; Form B1	Other types upon request.
ASME B16.5 CL 150 R.F.	

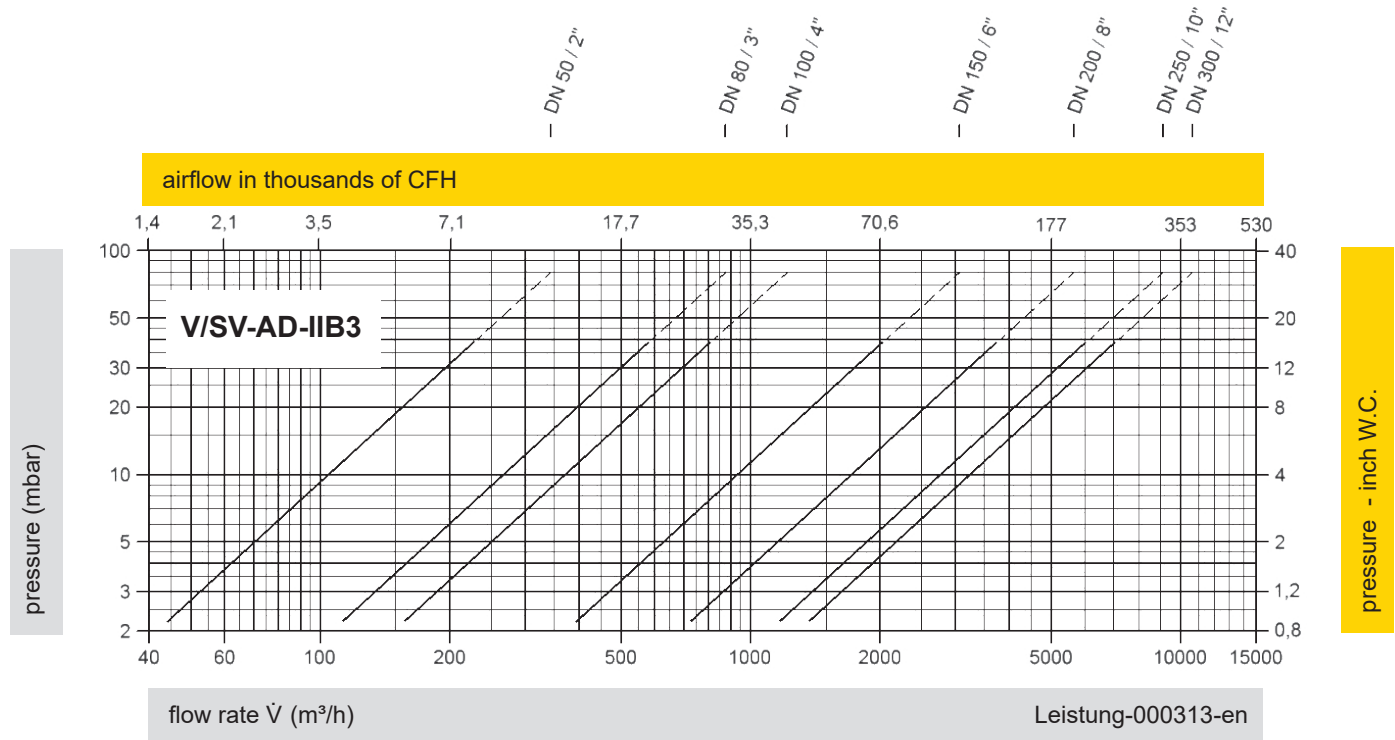




# Vacuum Relief Valve

## Flow Capacity Chart

### PROTEGO® V/SV-AD-IIB3



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