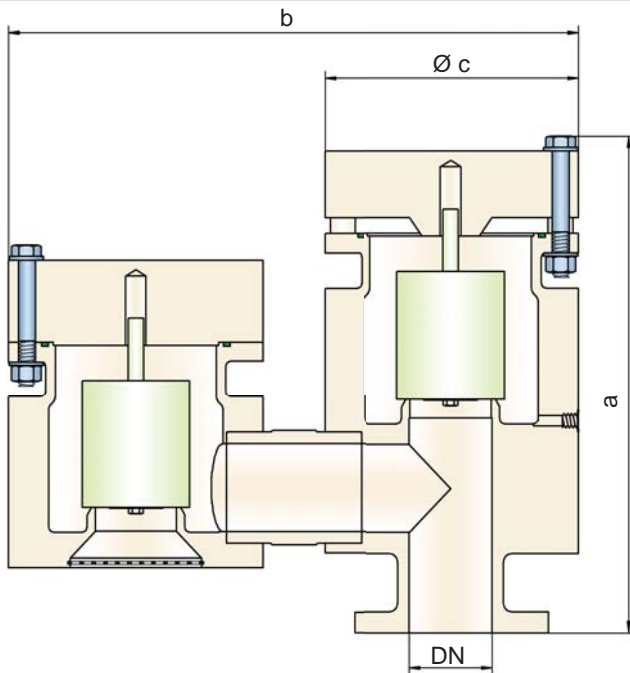


Pressure and Vacuum Relief Valve

made of plastic

PROTEGO® VD/KSM



Settings:

Pressure:

| | | |
|----------------|-------|-----------------------------------|
| +6.0 mbar | up to | +100 mbar (DN 50/2") |
| +2.4 inch W.C. | up to | +40 inch W.C. |
| +4.0 mbar | up to | +100 mbar (DN 80/3") |
| +1.6 inch W.C. | up to | +40 inch W.C. |
| +4.5 mbar | up to | +100 mbar (DN 100/4" - DN 200/8") |
| +1.8 inch W.C. | up to | +40 inch W.C. |

Vacuum:

| | | |
|----------------|-------|-----------------------------------|
| -6.0 mbar | up to | -100 mbar (DN 50/2") |
| -2.4 inch W.C. | up to | -40 inch W.C. |
| -4.0 mbar | up to | -100 mbar (DN 80/3") |
| -1.6 inch W.C. | up to | -40 inch W.C. |
| -4.5 mbar | up to | -100 mbar (DN 100/4" - DN 200/8") |
| -1.8 inch W.C. | up to | -40 inch W.C. |

Higher and lower settings upon request

Function and Description

The PROTEGO® valve VD/KSM is a state-of-the-art pressure and vacuum relief valve with excellent flow performance made of highgrade synthetic material. Typically the valve is installed in the in- and out-breathing lines of tanks, vessels and process apparatus to protect against unallowable high or low pressure. The valve prevents emission losses almost up to the set pressure. The valve is a perfect solution for corrosive, polymerizing or sticky media.

The device will start to open as soon as the set pressure is reached and only requires 10% overpressure to full lift. Continuous investments into research and development have allowed PROTEGO® to develop a low pressure valve which has the same opening characteristic as a high pressure safety relief valve. This "full lift type" technology allows the valve to be set just 10% below the maximum allowable working pressure and vacuum (MAWP and MAWV) of the tank and still safely vent the required mass flow. The opening characteristic for pressure and vacuum side is the same.

Due to our highly developed manufacturing technology the tank pressure is maintained up to set pressure with a tightness that is far superior to the conventional standard. This feature is achieved by special valve seats made of high quality synthetic material or PTFE. After the excess pressure is discharged or vacuum is compensated, the valve reseats and provides a tight seal.

The optimized fluid dynamic design of the valve body and valve pallet is a result of many years of research work, which allow a stable operation of the valve pallet and optimized performance resulting in reduction of product losses.

Special Features and Advantages

- "full lift type" technology valve utilizes only 10% overpressure to reach full lift
- extreme tightness and hence least possible product losses and reduced environmental pollution
- the set pressure is close to the opening pressure which results in best possible pressure management of the system
- the valve pallet is guided within the housing to protect against harsh weather conditions
- corrosion resistant valve
- perfect solution for corrosive, polymerizing and sticky media
- weight reduction in comparison to steel/stainless steel
- vacuum side self draining and pressure side condensate drain
- smooth surface
- different plastics can be combined
- maintenance friendly design

Design Types and Specifications

The valve pallets are weight-loaded, and the highest pressure levels are only attained with metal discs.

Pressure/vacuum valve in basic design **VD/KSM-**

Additional special devices available upon request.



Vents for corrosive vapor service
(Flyer pdf)



Vents - 10% Technology
(Flyer pdf)



Leak Rate/10% Technology
(Flyer pdf)

Table 1: Dimensions

Dimensions in mm / inches

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

| DN | 50 / 2" | 80 / 3" | 100 / 4" | 150 / 6" | 200 / 8" |
|----|-------------|-------------|----------------------------|----------------------------|------------------------------|
| a | 376 / 14.80 | 521 / 20.51 | 563 / 22.17 (542 / 21.34)* | 670 / 26.38 (681 / 26.81)* | 917 / 36.10 (952 / 37.48)* |
| b | 430 / 16.93 | 575 / 22.64 | 700 / 27.56 (675 / 26.57)* | 825 / 32.48 (880 / 34.65)* | 1190 / 46.85 (1100 / 43.31)* |
| c | 180 / 7.09 | 250 / 9.84 | 300 / 11.81 | 350 / 13.78 (405 / 15.94)* | 560 / 22.05 (500 / 19.68)* |

* Dimensions in brackets only for PVDF

Table 2: Material selection for the housing

| Design | A | B | C | |
|-----------------------|---------|---------|------|--------------------------------|
| Housing | PE | PP | PVDF | Special Materials upon request |
| Valve seat | PE | PP | PVDF | |
| Sealing | FPM | FPM | FPM | |
| Pressure valve pallet | A, C, D | B, C, D | C, D | |
| Vacuum valve pallet | A, C, D | B, C, D | C, D | |

Table 3: Material selection for pressure valve pallet

| Design | A | B | C | D |
|--------------------------------------|-----------------------------------|-----------------------------------|----------------------------------|---------------------------------|
| Pressure range (mbar) (inch W.C.) | +6.0 up to +16 +2.4 up to +6.4 | +5.5 up to +16 +2.2 up to +6.4 | +9.5 up to +30 +3.8 up to +12 | +30 up to +100 +12 up to +40 |
| Valve pallet | PE | PP | PVDF | Hastelloy |
| Sealing | PTFE | PTFE | PTFE | PTFE |
| Spindle guide | PE | PP | PVDF | Hastelloy |
| Weight | PE | PP | PVDF | Hastelloy |

Special materials and other pressure settings are available upon request

Table 4: Material selection for vacuum valve pallet

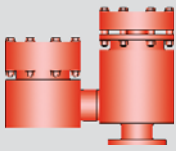
| Design | A | B | C | D |
|------------------------------------|-----------------------------------|-----------------------------------|----------------------------------|---------------------------------|
| Vacuum range (mbar) (inch W.C.) | -6.0 up to -16 -2.4 up to -6.4 | -5.5 up to -16 -2.2 up to -6.4 | -9.5 up to -30 -3.8 up to -12 | -30 up to -100 -12 up to -40 |
| Valve pallet | PE | PP | PVDF | Hastelloy |
| Sealing | PTFE | PTFE | PTFE | PTFE |
| Spindle guide | PE | PP | PVDF | Hastelloy |
| Weight | PE | PP | PVDF | Hastelloy |

Special materials and other vacuum settings are available upon request

Table 5: Flange connection type

| | |
|--------------------------|--------------------------|
| EN 1092-1; Form A | other types upon request |
| ASME B16.5; 150 lbs FF5F | |

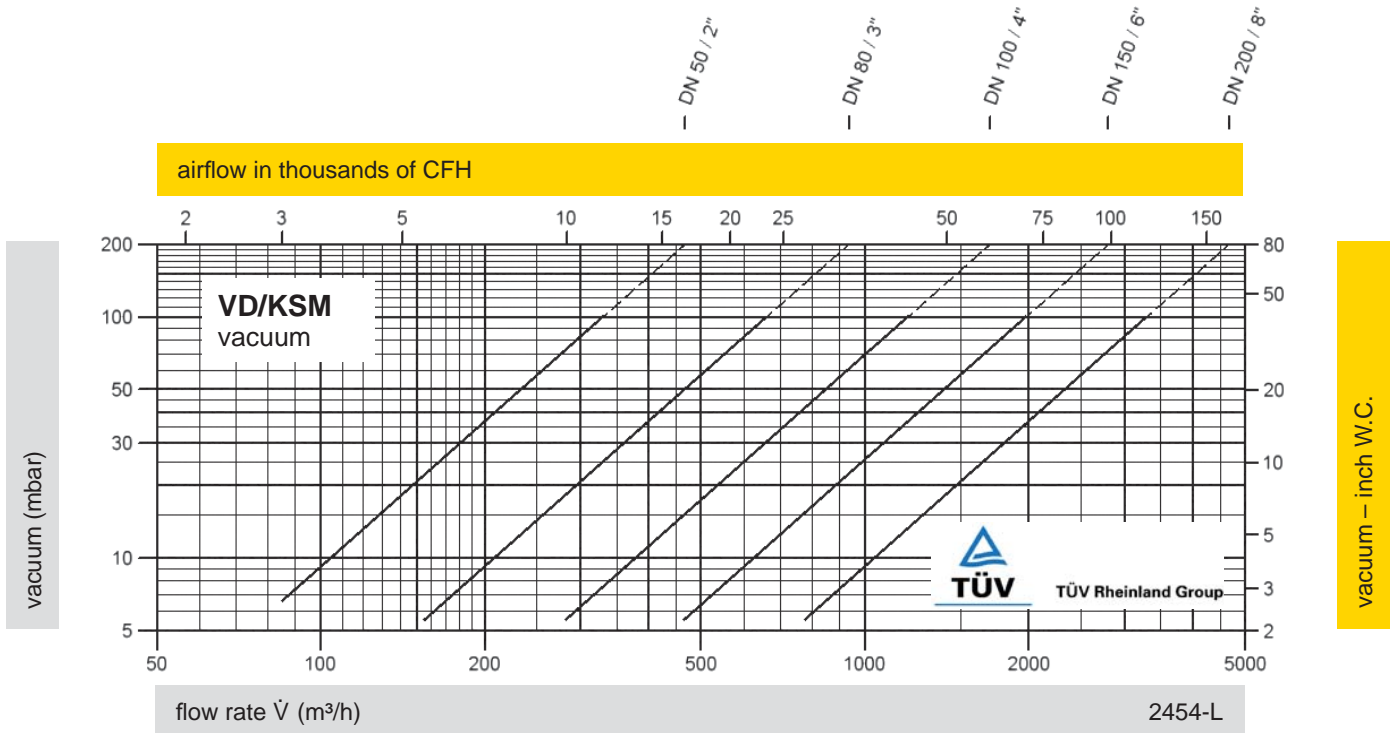
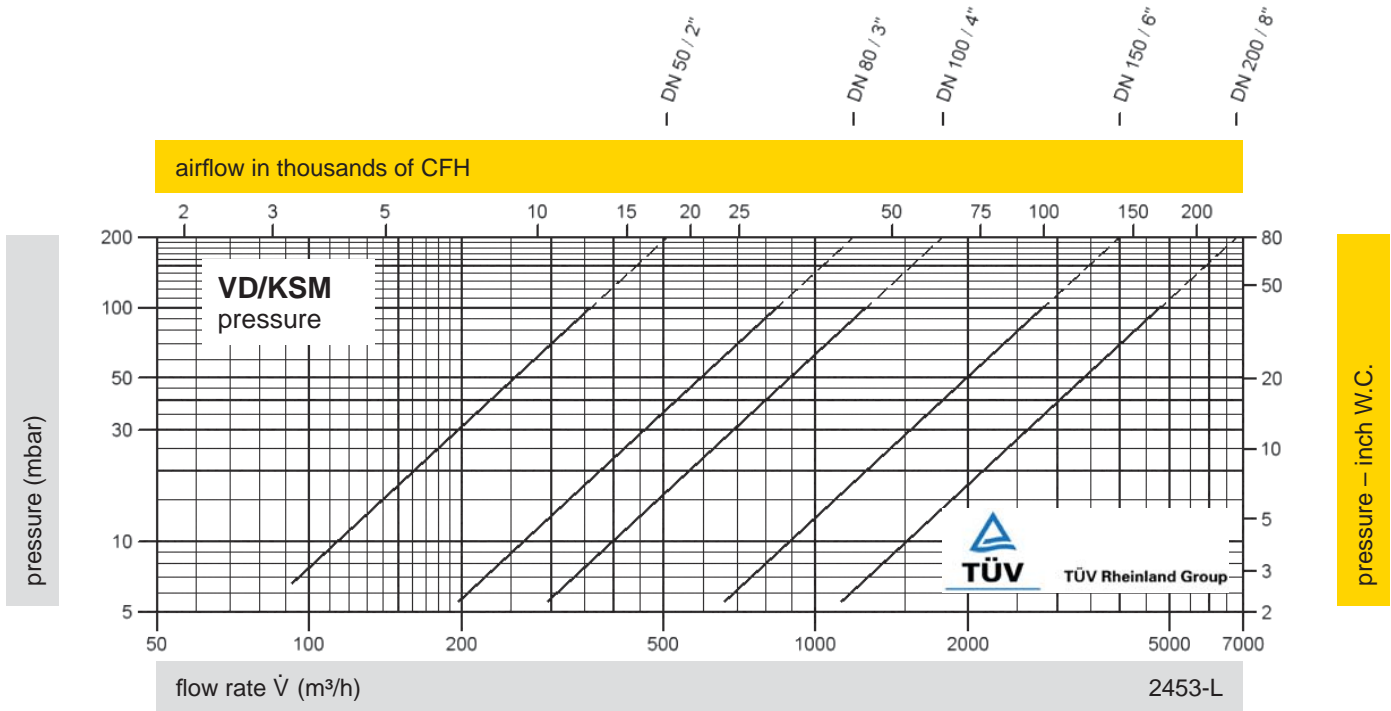




Pressure and Vacuum Relief Valve

Flow Capacity Charts

PROTEGO® VD/KSM



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".