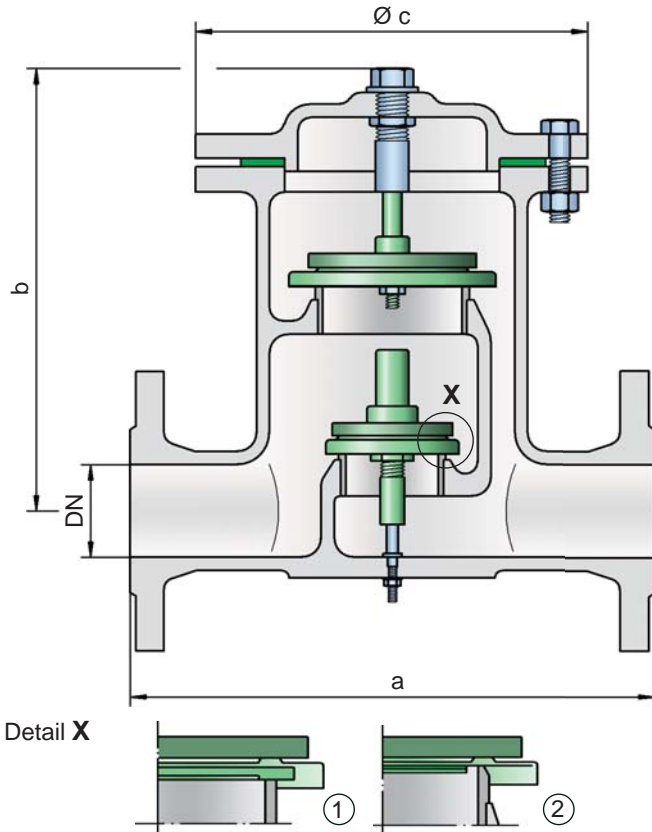


## Pressure and Vacuum Relief Valve, In-Line

### PROTEGO® DV/ZT



Tank connection depends upon flow capacity, set pressure and set vacuum for in- and outbreathing

#### Pressure or vacuum settings:

Upper valve pallet:  $\pm 2.0$  mbar up to  $\pm 60$  mbar  
 $\pm 0.8$  inch W.C. up to  $\pm 24$  inch W.C.

Lower valve pallet:  $\pm 3.5$  mbar up to  $\pm 50$  mbar  
 $\pm 1.4$  inch W.C. up to  $\pm 20$  inch W.C.

For higher set pressure refer to type DV/ZT-F. Lower set vacuum upon request.

#### Function and Description

The PROTEGO® in-line valve DV/ZT is a state-of-the-art pressure and vacuum relief valve. Typically the valve is installed in the in- and out-breathing lines of tanks, vessels and process apparatus to protect against unallowable high and low pressure. The valve prevents emission losses almost up to the set pressure and provides protection from product entry into the system. Due to its design the lower valve pallet is one size smaller than the upper valve pallet.

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 or vacuum (MAWP or MAWV) of the tank and still safely vent the required mass flow. 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 facilitated by 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 the valve pallets from sticking when sticky products are used and to enable the use of corrosive fluids. After the excess pressure is discharged or vacuum is balanced, 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
- high performance seal reducing product loss below EPA's 500ppm rule preventing environmental pollution
- based on 10% technology the set pressure is close to the opening pressure which results in best possible pressure management of the system compared to conventional 40%- or 100%- technology valves
- optimized flow performance, which reduces capital cost to a minimum as smaller sized valves may be used
- can be installed in explosion hazardous areas
- housing designed to 150 psi (PN 10)
- maintenance friendly design

#### Designs and Specifications

The valve pallets are weight loaded. Higher set pressures are achieved by using spring loaded type DV/ZT-F

Two different designs are available:

In-line pressure and vacuum relief valve, standard design **DV/ZT - □**

In-line pressure and vacuum relief valve with heating jacket **DV/ZT - □H**

Additional special devices available upon request.

Within piping systems the influence of backpressure has to be considered in deciding the set pressure and opening characteristics. For special design solutions (e.g. partial load operation) the valve can be supplied with standard valve pallets (with proportional opening function).

**Table 1: Dimensions**

Dimensions in mm / inches

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

DN	40 / 1 ½"	50 / 2"	80 / 3"	100 / 4"	150 / 6"
a	280 / 11.02	280 / 11.02	340 / 13.39	390 / 15.35	520 / 20.47
b	270 / 10.63	270 / 10.63	290 / 11.42	355 / 13.98	425 / 16.73
c	210 / 8.27	210 / 8.27	280 / 11.02	310 / 12.20	390 / 15.35

Larger sizes upon request

Dimensions for pressure and vacuum relief valve with heating jacket upon request

**Table 2: Material selection for housing**

Design	A	B	Option: Housing with ECTFE-lining Special materials upon request
Housing	Steel	Stainless Steel	
Heating jacket (DV/ZT-H-...)	Steel	Stainless Steel	
Valve seat	Stainless Steel	Stainless Steel	
Gasket	PTFE	PTFE	

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

Design	A	B	C	D	Special materials upon request For higher set pressures refer to type DV/ZT-F
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 ±60 ±5.6 up to ±24	±14 up to ±60 ±5.6 up to ±24	
Valve pallet	Aluminium	Stainless Steel	Stainless Steel	Stainless Steel	
Sealing	FEP	FEP	Metal to Metal	PTFE	

**Table 4: Material selection for lower valve pallet**

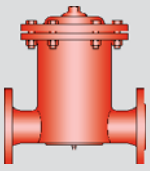
Design	A	B	C	D	E	F
Pressure range (mbar) (inch W.C.)	±3.5 up to ±5.0 ±1.4 up to ±2.0	±5.0 up to ±14 ±2.0 up to ±5.6	±14 up to ±35 ±5.6 up to ±14	±35 up to ±50 ±14 up to ±20	±14 up to ±35 ±5.6 up to ±14	±35 up to ±50 ±14 up to ±20
Valve pallet	Aluminium	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel	Stainless Steel
Sealing	FEP	FEP	Metal to Metal	Metal to Metal	PTFE	PTFE

Special materials and lower set vacuum upon request

**Table 5: Flange connection type**

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

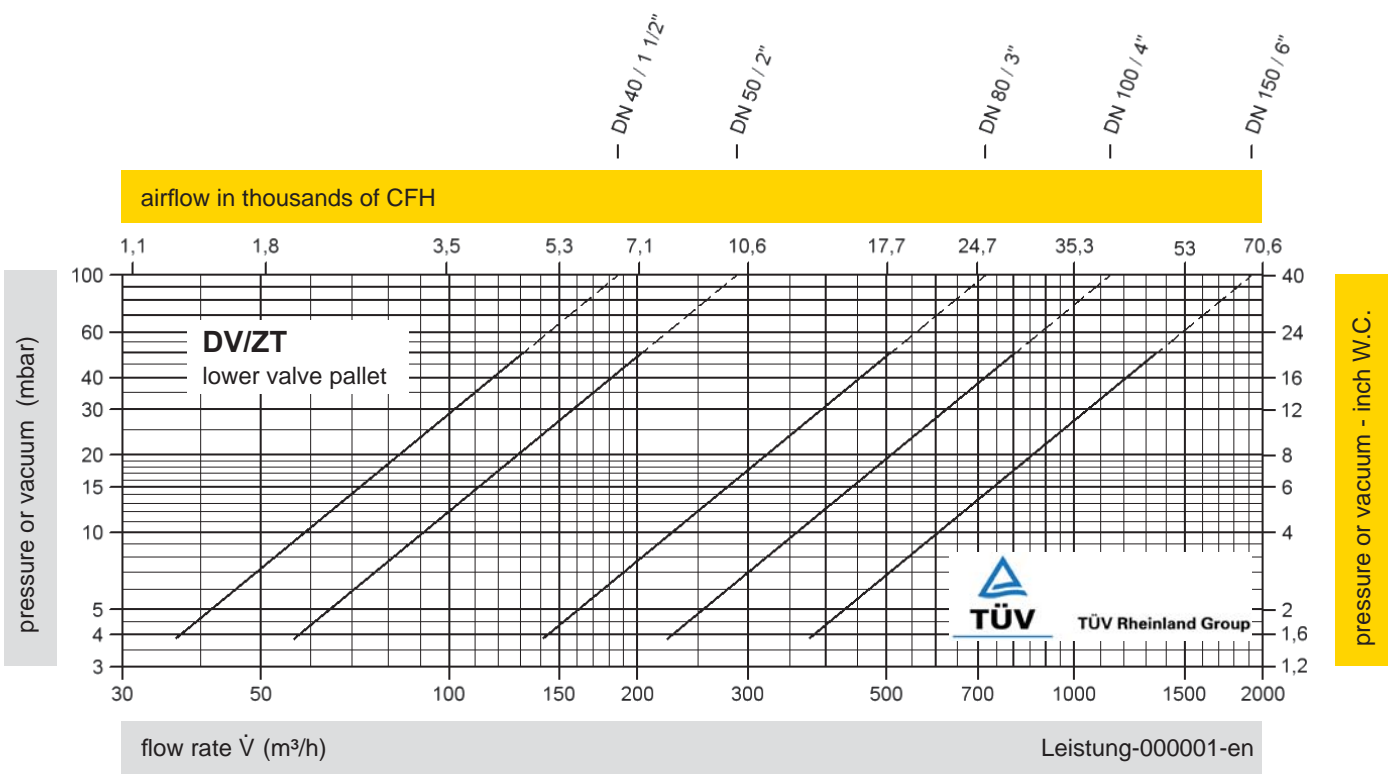
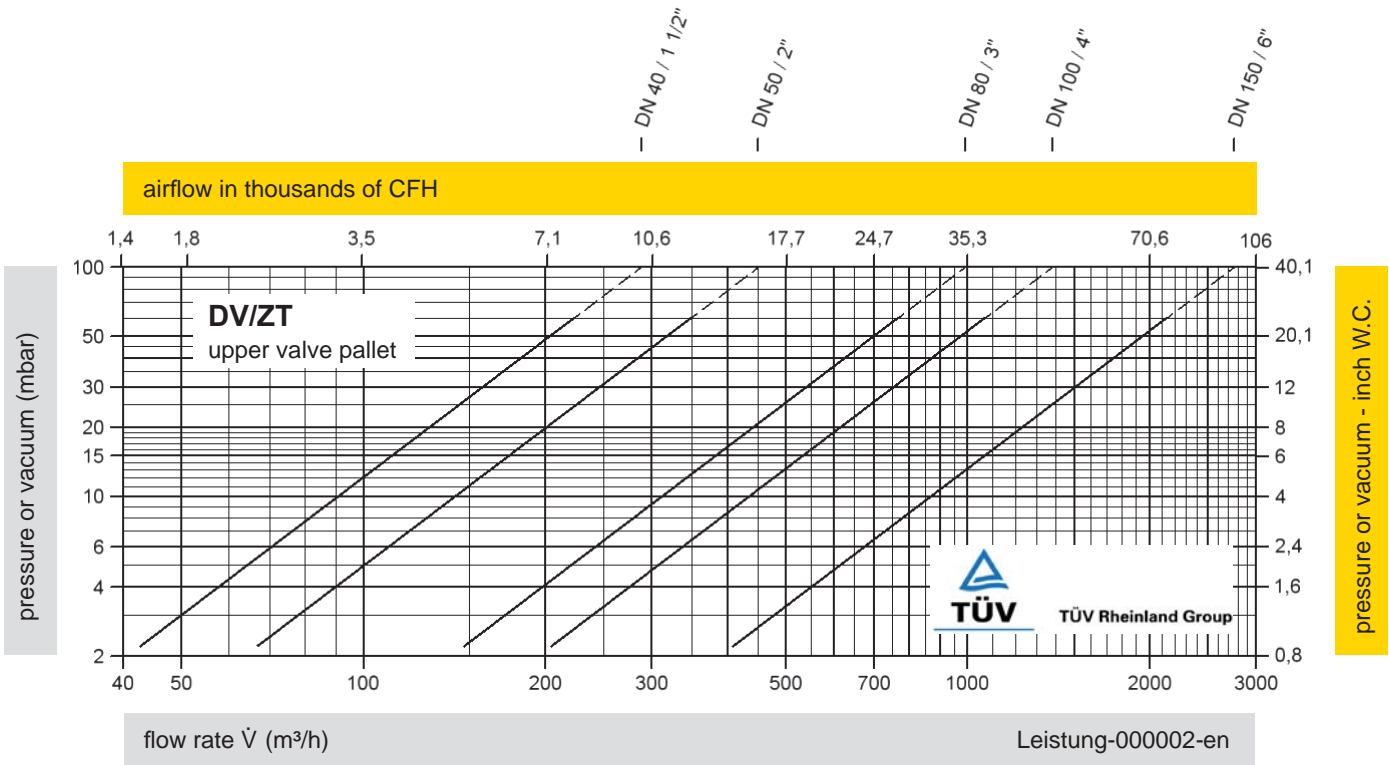




# Pressure and Vacuum Relief Valve, In-Line

## Flow Capacity Charts

### PROTEGO® DV/ZT



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".