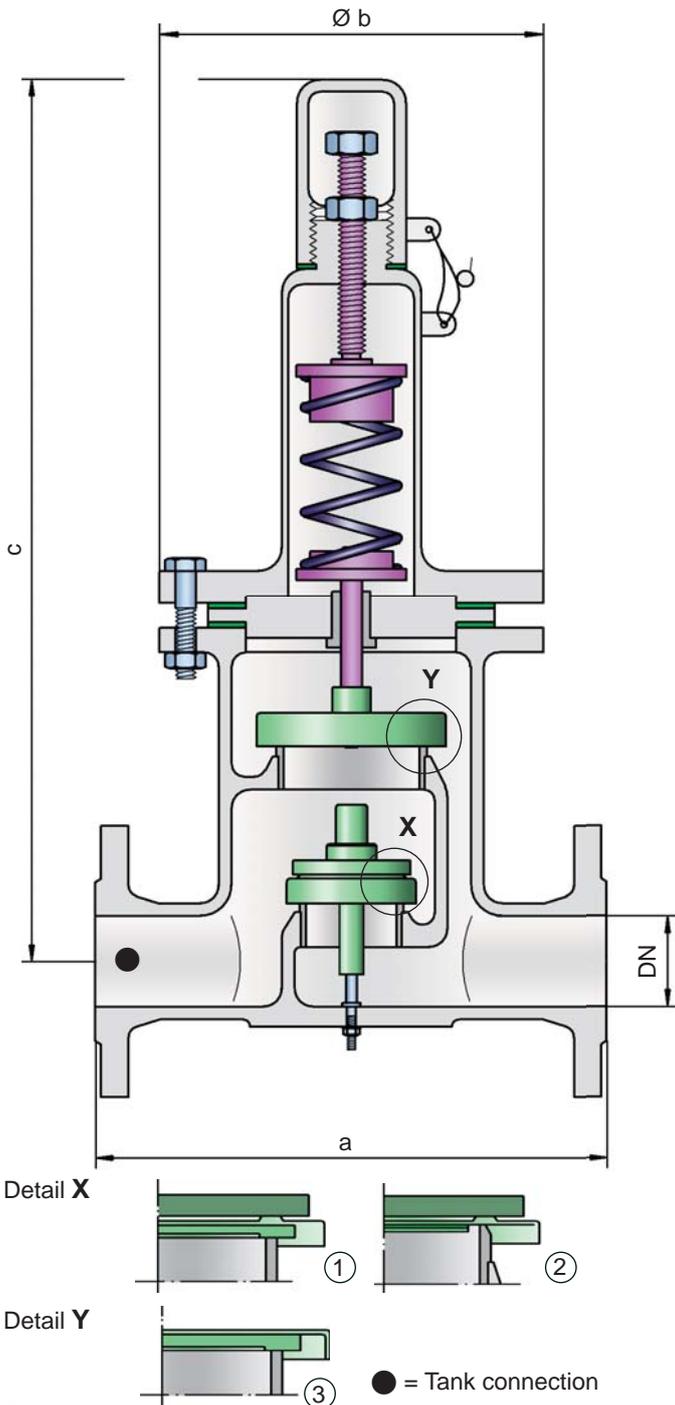




Pressure and Vacuum Relief Valve, In-Line

PROTEGO® DV/ZT-F



Function and Description

The PROTEGO® in-line valve DV/ZT-F 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 vacuum valve pallet is one size smaller than the pressure valve pallet. Due to the spring loaded design higher set pressures can be achieved.

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), (3) or with an air cushion seal (2) in conjunction with high quality FEP diaphragm and a rugged valve body. After the excess pressure is discharged or the 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)
- spring loaded on pressure side to achieve higher set pressures
- maintenance friendly design

Settings:

Pressure:

+60 mbar up to +500 mbar (DN 40/1 ½" up to 150/6")
 +24 inch W.C. up to +200 inch W.C.
 >+60 mbar up to +400 mbar (DN200/8";DN 250/10")
 >+24 inch W.C. up to +160 inch W.C.

Vacuum: -14 mbar up to -50 mbar
 -5.6 inch W.C. up to -20 inch W.C.

Vacuum: -3.5 mbar up to -14 mbar
 -1.4 inch W.C. up to -5.6 inch W.C.
 by set pressure up to +150 mbar / +60 inch W.C.

For lower set pressure refer to type DV/ZT.

Higher set pressure and lower set vacuum upon request.

Designs and Specifications

The pressure valve pallet is spring loaded, the vacuum valve pallet weight loaded. Lower set pressures for the pressure side are achieved through weight loaded type DV/ZT.

Two different designs are available:

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

In-line pressure and vacuum relief valve with heating jacket **DV/ZT-F - 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 pages								
DN	40 / 1 1/2"	50 / 2"	80 / 3"	100 / 4"	150 / 6"	200 / 8"	250 / 10"	
a	280 / 11.02	280 / 11.02	340 / 13.39	390 / 15.35	520 / 20.47	650 / 25.59	750 / 29.53	
b	210 / 8.27	210 / 8.27	280 / 11.02	310 / 12.20	390 / 15.35	565 / 22.24	610 / 24.02	
c	605 / 23.82	605 / 23.82	730 / 28.74	870 / 34.25	1170 / 46.06	1030 / 40.55	1335 / 52.56	

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

Table 3: Material of pressure valve pallet		
Design	A	
Pressure range (mbar) (inch W.C.)	>+60 up to +500 >+24 up to +200	Special materials upon request
Valve pallet	Stainless Steel	For lower set pressure use type DV/ZT. Higher set pressure and lower set vacuum upon request.
Sealing	Metal to Metal	
Pressure spring	Stainless Steel	

Table 4: Material selection for vacuum valve pallet					
Design	A*	B*	C	D	
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	Special materials and lower set vacuum upon request
Valve pallet	Aluminium	Stainless Steel	Stainless Steel	Stainless Steel	
Sealing	FEP	FEP	Metal to Metal	Metal to Metal	

* by set pressure up to +150 mbar / +60 inch W.C.

Table 5: Flange connection type	
EN 1092-1; Form B1	other types upon request
ASME B16.5; 150 lbs RFSF	

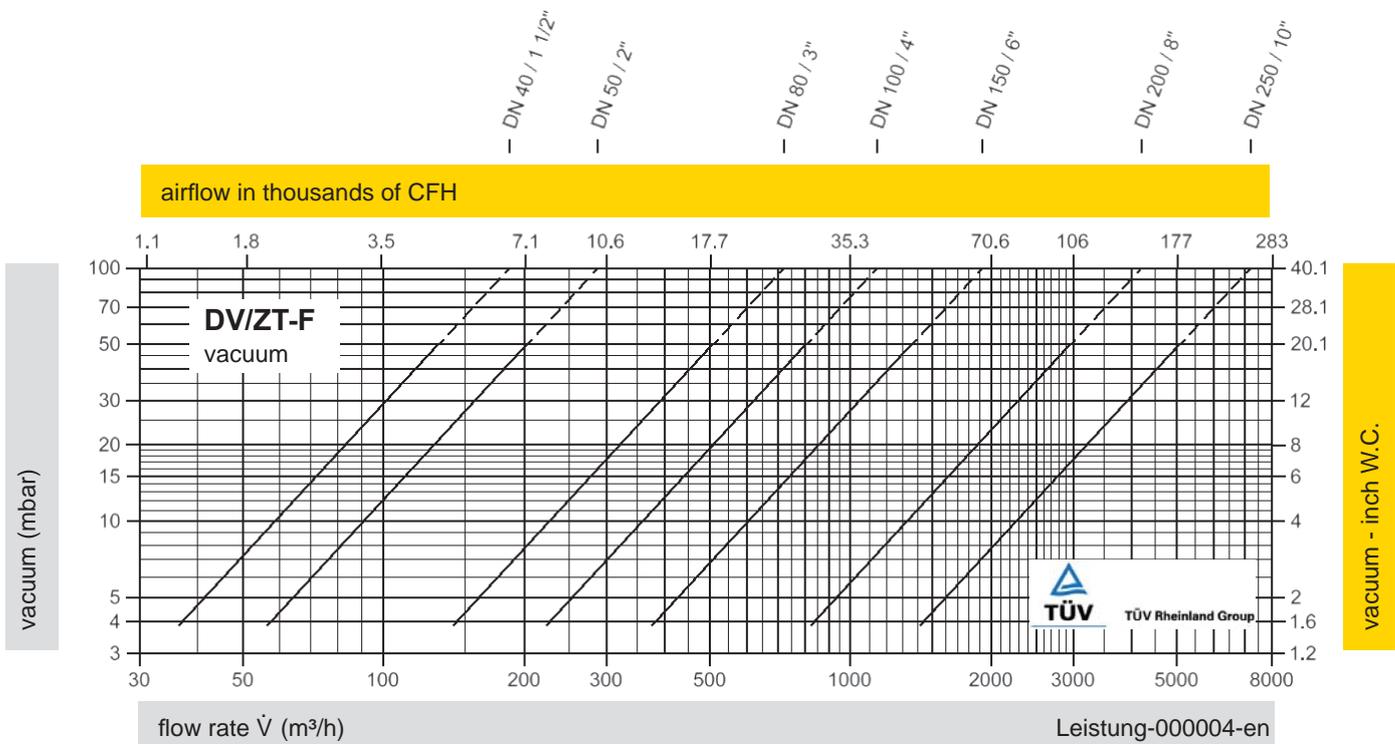
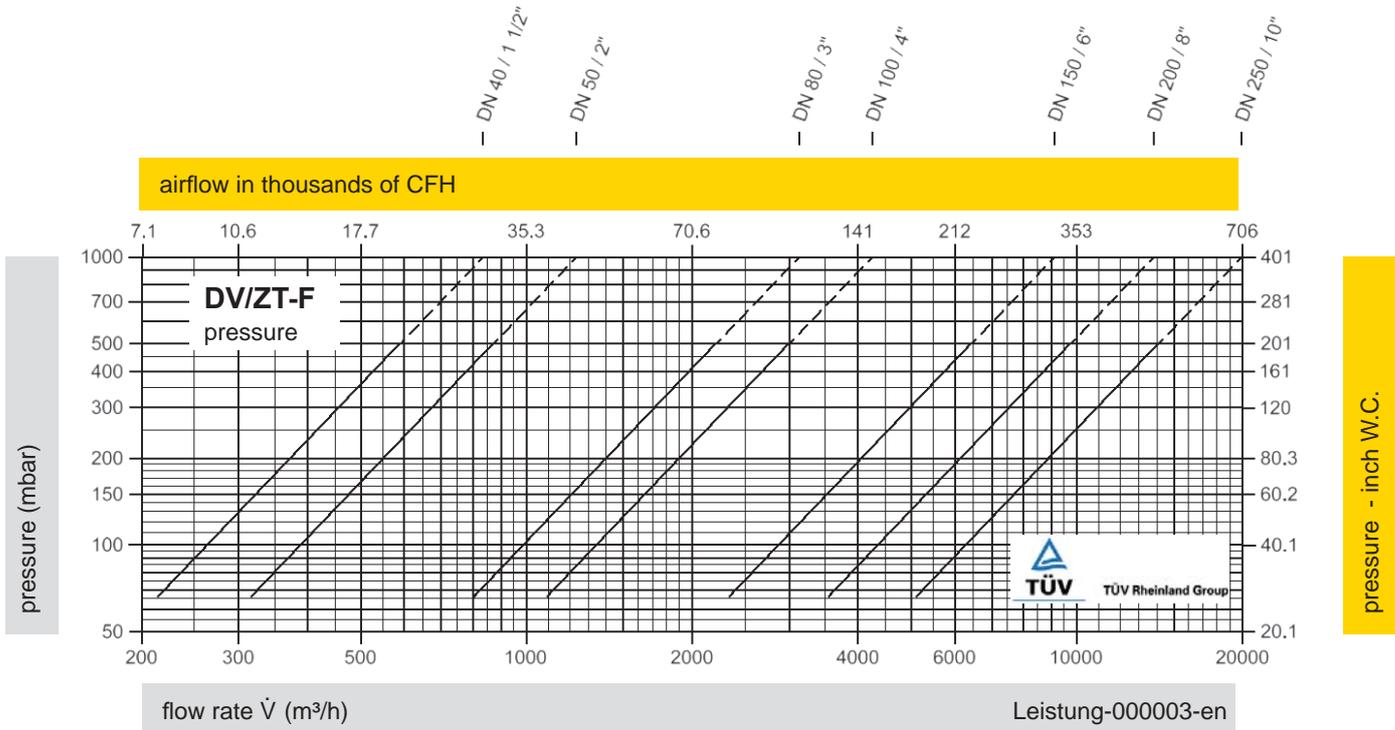




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Flow Capacity Charts

PROTEGO® DV/ZT-F



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".