

Pressure and Vacuum Relief Valve, In-Line



PROTEGO® DV/ZT-F

Function and Description

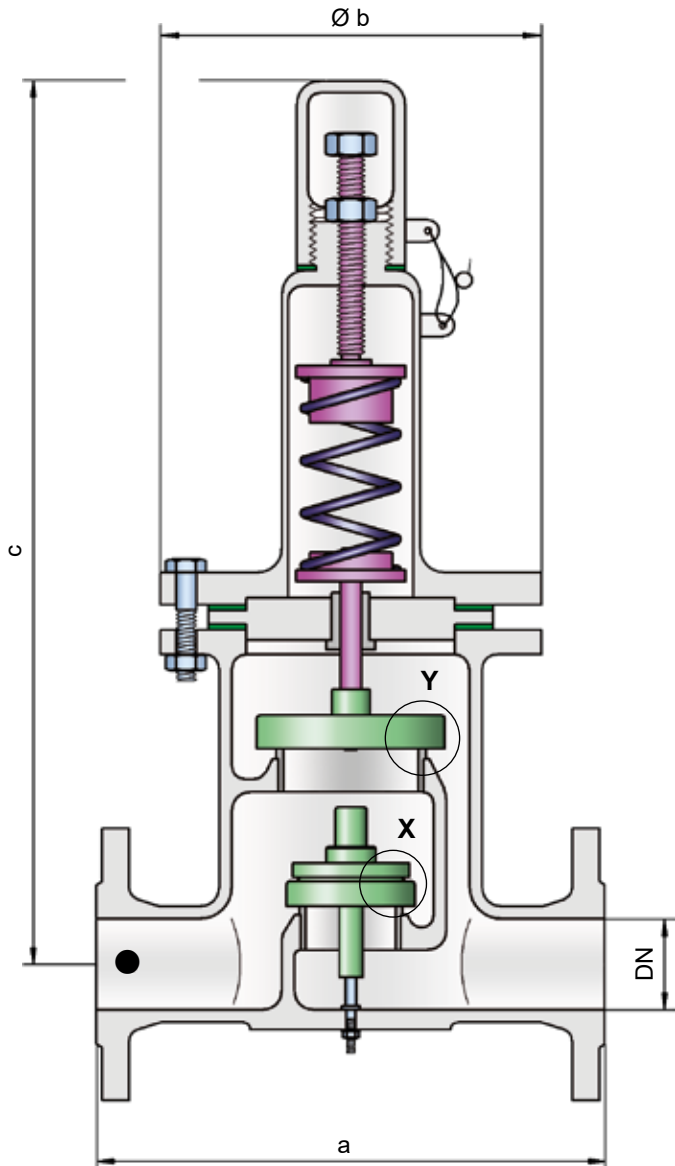
The PROTEGO® in-line valve DV/ZT-F is a state-of-the-art pressure and vacuum relief valve. Typically, the valve is installed in the in-breathing and out-breathing lines of tanks, vessels, and process equipment to protect against unallowable overpressure and underpressure. The valve prevents emission losses almost up to the set pressure and prevents unacceptable product entry system. For structural reasons, 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 in and a commitment to 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 at 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 above to the conventional standard. This feature is ensured 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 sturdy housing design. After the overpressure is released of the vacuum is balanced, the valve re-seats and provides a tight seal.

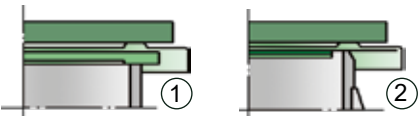
The optimized fluid dynamic design of the valve body and valve pallet is a result of many years of research, resulting in stable operation of the valve pallet, optimized performance, and reduced product losses

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
- based on 10% technology, set pressure is close to opening pressure for optimum pressure maintenance in the system as compared to conventional 40% or 100% technology
- high flow capacity reduces costs through the use of smaller valves
- can be used in explosion hazardous areas
- sturdy housing design (PN 10)
- spring-loaded on overpressure side for higher set pressures
- maintenance-friendly design



Detail X



Detail Y



● = Tank connection

Settings:

Pressure:

- +60 mbar up to +500 mbar (DN 40/1 1/2" 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.



Vents - 10% Technology
(Flyer pdf)



Leak Rate/10% Technology
(Flyer pdf)



Coated Devices
(Flyer pdf)



The optimized valve pallet
(Flyer pdf)

Designs and Specifications

The pressure valve pallet is spring-loaded, and 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 when 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).



Spring-loaded PV-Valves
Maintenance-friendly design (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	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	The housings are also available with an ECTFE coating. 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.
Sealing	Metal to Metal	Higher set pressure and lower set vacuum upon request.
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	Aluminum	Stainless Steel	Stainless Steel	Stainless Steel	
Sealing	FEP	FEP	Metal to Metal	Metal to Metal	

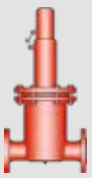
* by set pressure up to +150 mbar / +60 inch W.C.

Table 5: Flange connection type

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



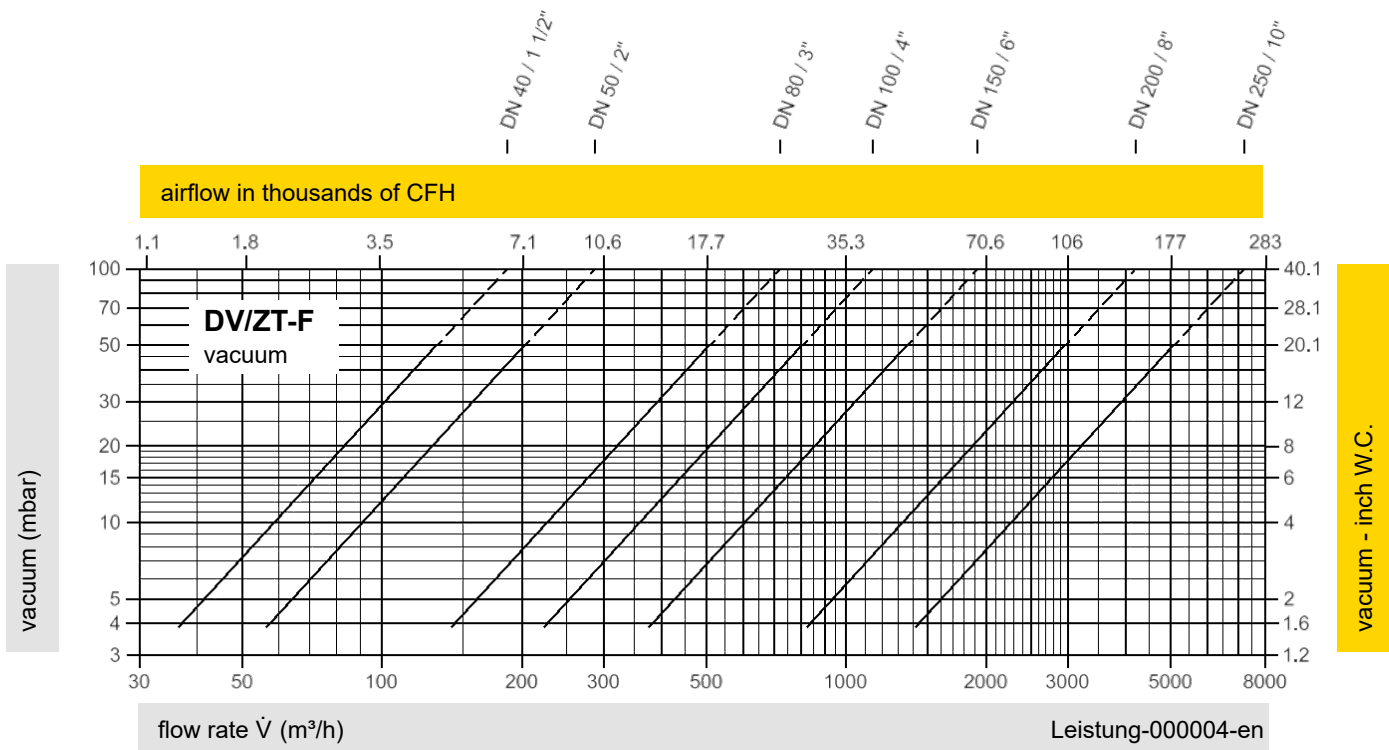
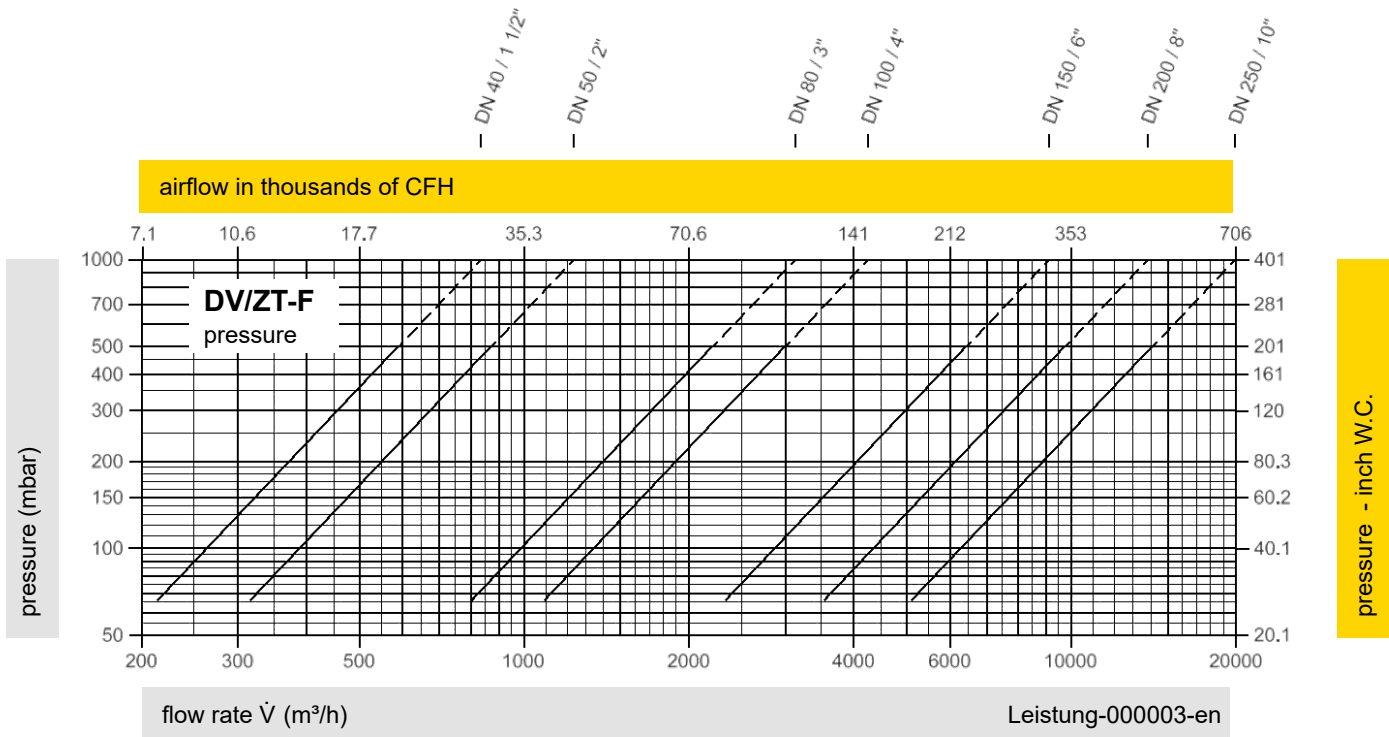
for safety and environment



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