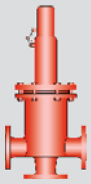
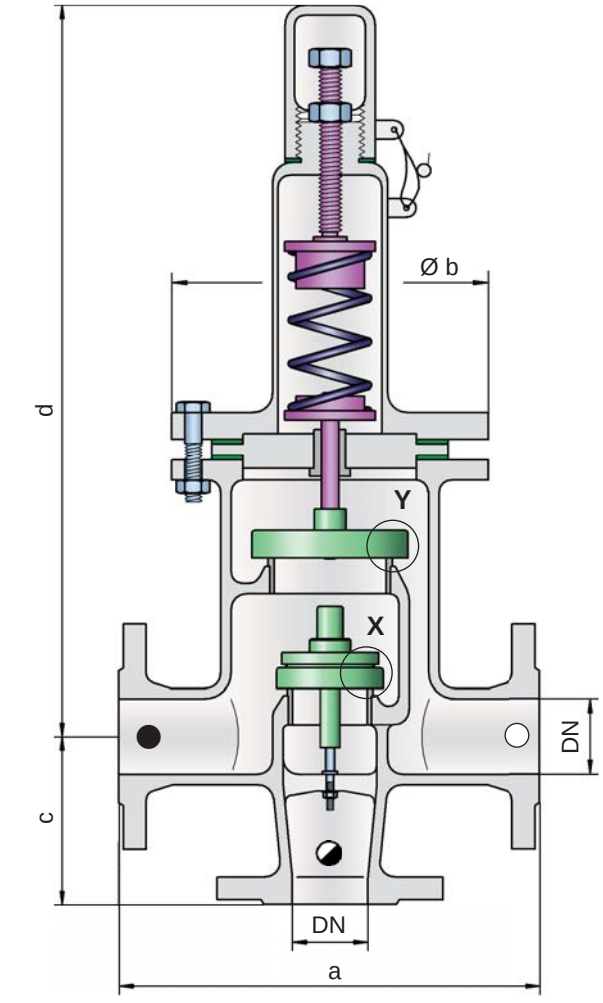
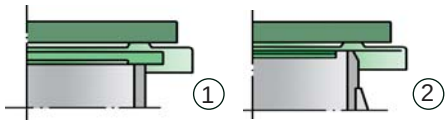


Pressure and Vacuum Relief Valve, In-Line

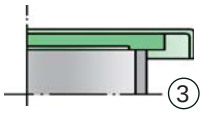
PROTEGO® DV/ZU-F



Detail **X**



Detail **Y**



● = Tank connection
◒ = Inbreathing
○ = Outbreathing

Settings:

Pressure: +60 mbar up to +500 mbar
+24 inch W.C. up to +200 inch W.C.

Vacuum: -3.5 mbar up to -50 mbar
-1.4 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/ZU.
Higher set pressure and lower set vacuum upon request.

Function and Description

The PROTEGO® in-line valve DV/ZU is a state-of-the-art pressure and vacuum relief valve with separate flange connections for pressure and vacuum breathing. 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 prevents air intake almost up to set vacuum. The valve is designed so that in cases in which the set pressure is exceeded the vapours are vented into a discharge pipe (e.g. vent header). When the set vacuum is exceeded atmospheric air is pulled into the system. Due to its design the vacuum valve pallet is one size smaller than the pressure valve pallet. The spring loaded design of the pressure pallet allows achieving higher set pressures.

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. The opening characteristic of the pressure and vacuum side is basically the same. However, the inbreathing will start as soon as the differential pressure between the connected inbreathing line and the tank is greater than the set pressure of the vacuum pallet. 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
- separate flange connection for in- and outbreathing line
- can be installed in explosion hazardous areas
- housing designed to 150 psi (PN 10)
- spring loaded pressure side to achieve higher set pressures
- maintenance friendly design

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/ZU.

Two different designs are available:

In-line pressure and vacuum relief valve, standard design **DV/ZU-F** [–]

In-line pressure and vacuum relief valve with heating jacket **DV/ZU-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 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	210 / 8.27	210 / 8.27	280 / 11.02	310 / 12.20	390 / 15.35
c	165 / 6.50	165 / 6.50	200 / 7.87	240 / 9.45	300 / 11.81
d	565 / 22.24	565 / 22.24	675 / 26.57	805 / 31.69	1070 / 42.13

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 Heating jacket (DV/ZU-F-H-...)	Steel Steel	Stainless Steel Stainless Steel	Option: Housing with ECTFE-lining
Valve seat	Stainless Steel	Stainless Steel	Special materials upon request
Gasket	WS 3822	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/ZU
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	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 or DIN 2501, Form C, PN 16	EN or DIN	other types upon request
ANSI 150 lbs RFSF	ANSI	

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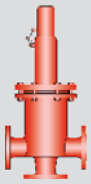
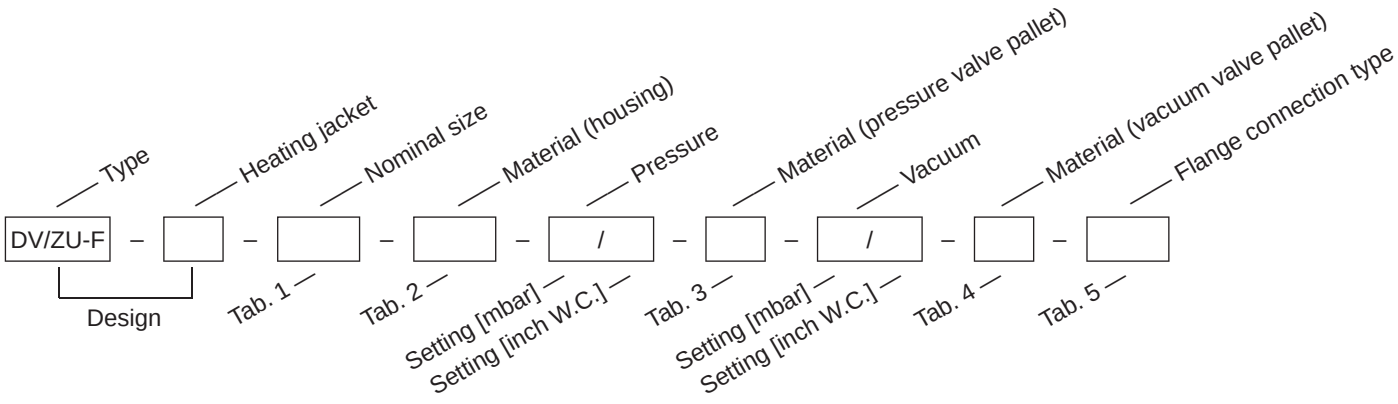


Pressure and Vacuum Relief Valve, In-Line

PROTEGO® DV/ZU-F

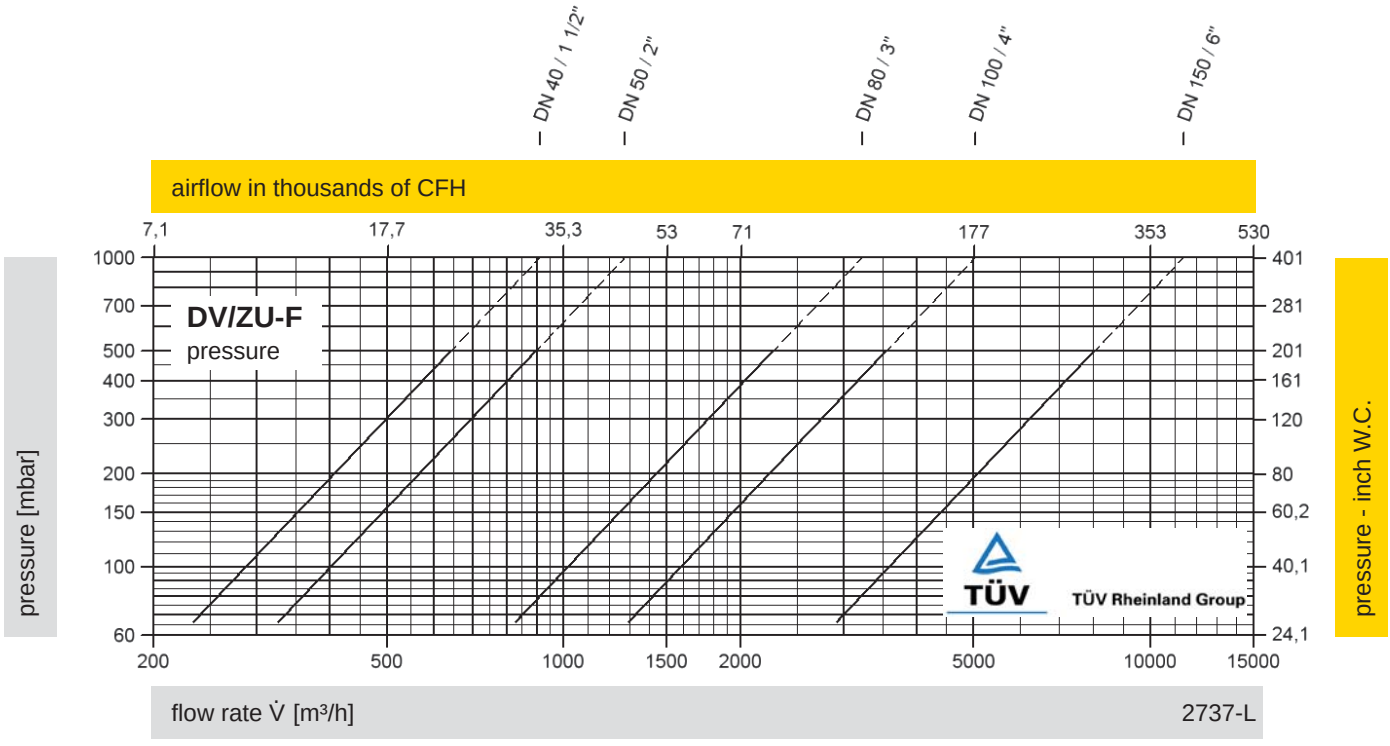


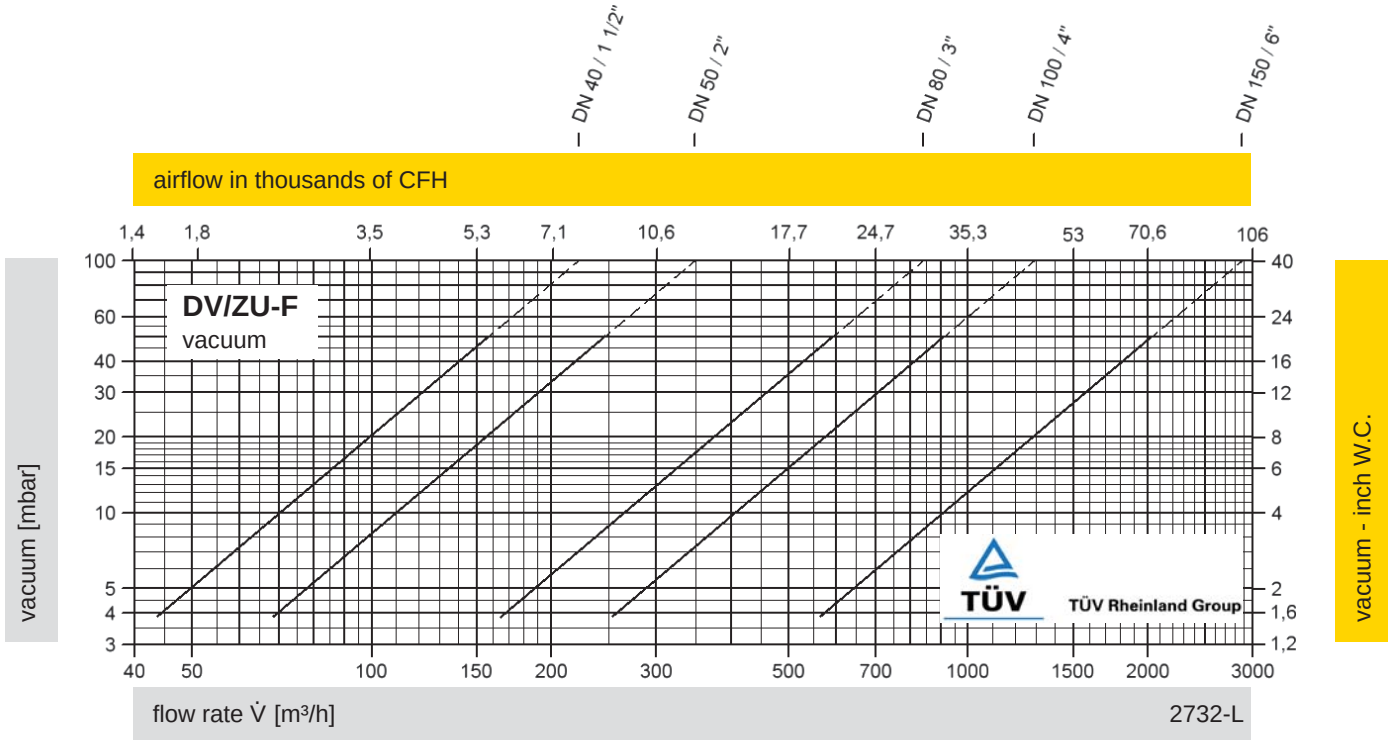
Order example

DV/ZU-F	–	H	–	100	–	B	–	300 / –	–	A	–	-4,0 / –	–	A	–	DIN

Materials and chemical resistance: See Vol. 1 “Technical Fundamentals”

PROTEGO® DV/ZU-F





The flow capacity chart has been determined with a calibrated and TÜV certified flow capacity test rig.
Volume flow V̇ 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”.

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