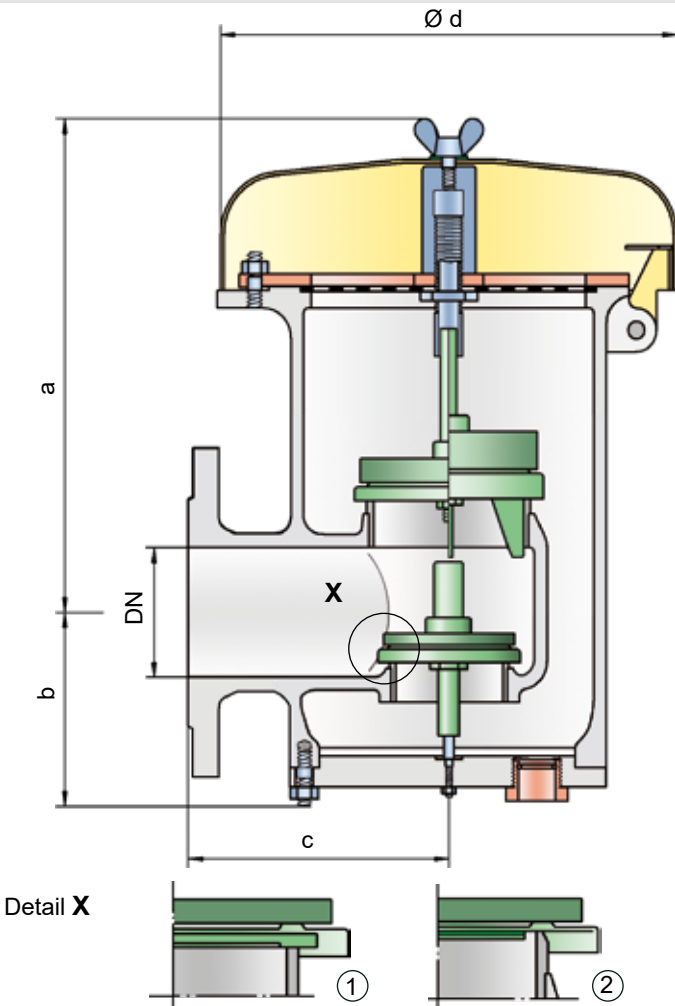


Pressure and Vacuum Relief Valve



PROTEGO® PV/ELR



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. The opening characteristic is the same for pressure and vacuum relief.

Due to the highly developed manufacturing technology, the tank pressure is maintained up to the set pressure, with a tightness that is far superior to the conventional standard. This feature is achieved by valve seats made of high quality stainless steel and with precisely 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 pallet from sticking when sticky products are used, and they enable the use of corrosive substances. After the overpressure is released or 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 a 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
- set pressure close to opening pressure for optimum pressure maintenance in the system
- high flow capacity
- valve pallet is guided inside the housing to protect against harsh weather conditions
- can be used in explosion hazardous areas
- automatic condensate drain
- compact, space-saving design
- available in a special design with lifting device
- maintenance-friendly design

Settings:

Pressure:	+2.0 mbar	up to	+210 mbar
	+0.8 inch W.C.	up to	+84 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.

for pressure up to max. + 150 mbar / 60.2 inch W.C.
Higher and lower settings upon request.

Function and Description

The PV/ELR type PROTEGO® valve is a highly developed combined pressure and vacuum relief valve with excellent flow performance. 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 air intake almost up to the set vacuum.

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

Design Types and Specifications

The valve pallets are weight-loaded. At set pressures greater than 35 mbar (14 inch W.C.), an extended design is used.

There are two different designs:

Pressure/vacuum relief valve in basic design **PV/ELR -**

Pressure/vacuum relief valve with heating jacket **PV/ELR - H**

Additional special devices available upon request.

Any combination of vacuum and pressure levels is possible. When the difference between the pressure and vacuum exceeds 150 mbar / 60.2 inch W.C., special valve pallets are used.



Vents - 10% Technology
(Flyer pdf)



Leak Rate/10% Technology
(Flyer pdf)



The optimized valve pallet
(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	80 / 3"	80 / 3"	100 / 4"	100 / 4"
Set pressure	≤ +35 mbar ≤ +14 inch W.C.	> +35 mbar > +14 inch W.C.	≤ +35 mbar ≤ +14 inch W.C.	> +35 mbar > +14 inch W.C.
a	345 / 13.58	475 / 18.70	345 / 13.58	475 / 18.70
b	146 / 5.75	146 / 5.75	146 / 5.75	146 / 5.75
c	218 / 8.58	218 / 8.58	218 / 8.58	218 / 8.58
d	353 / 13.90	353 / 13.90	353 / 13.90	353 / 13.90

Dimensions for pressure/
vacuum relief valve with
heating jacket upon request.

Table 2: Material selection for housing

Design	B	C
Housing	Steel	Stainless Steel
Heating jacket (PV/ELR-H-...)	Steel	Stainless Steel
Valve seat	Stainless Steel	Stainless Steel
Weather hood	Steel	Stainless Steel
Protective mesh screen	Stainless Steel	Stainless Steel

Special materials upon request.

Table 3: Material selection for pressure valve pallet

Design	A	B	C	D
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 +210 >+5.6 up to +84	>+14 up to +210 >+5.6 up to +84
Valve pallet	Aluminum	Stainless Steel	Stainless Steel	Stainless Steel
Sealing	FEP	FEP	Metal to Metal	PTFE

Special material and higher
set pressure upon request.

Table 4: Material selection for vacuum valve pallet

Design	A	B	C	D
Vacuum range (mbar) (inch W.C.)	-3.5 up to -5.0 -1.4 up to -2.0	<-3.0 up to -14 <-2.0 up to -5.6	<-14 up to -50 <-5.6 up to -20	<-14 up to -50 <-5.6 up to -20
Valve pallet	Aluminum	Stainless Steel	Stainless Steel	Stainless Steel
Sealing	FEP	FEP	Metal to Metal	PTFE

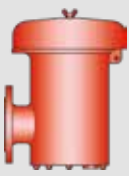
Special material and higher
set vacuum upon request.

Table 5: Flange connection type

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



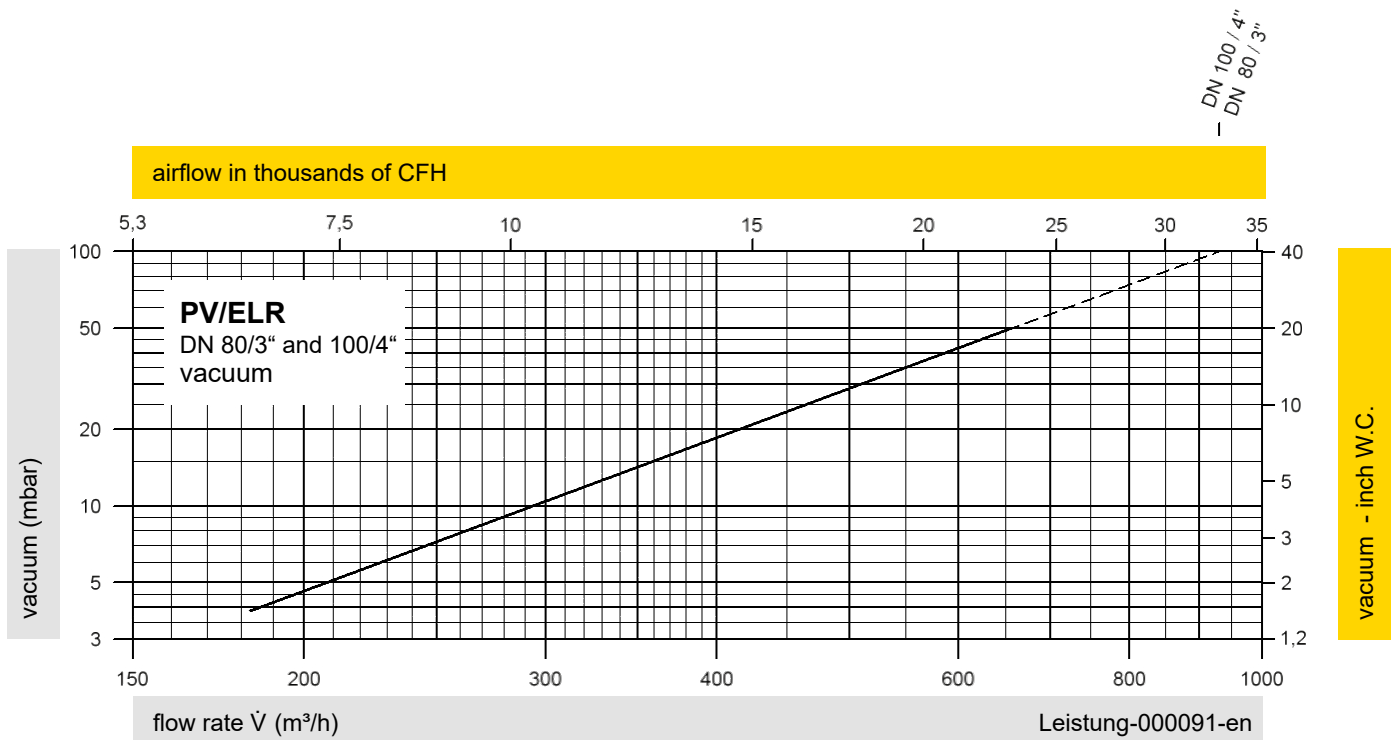
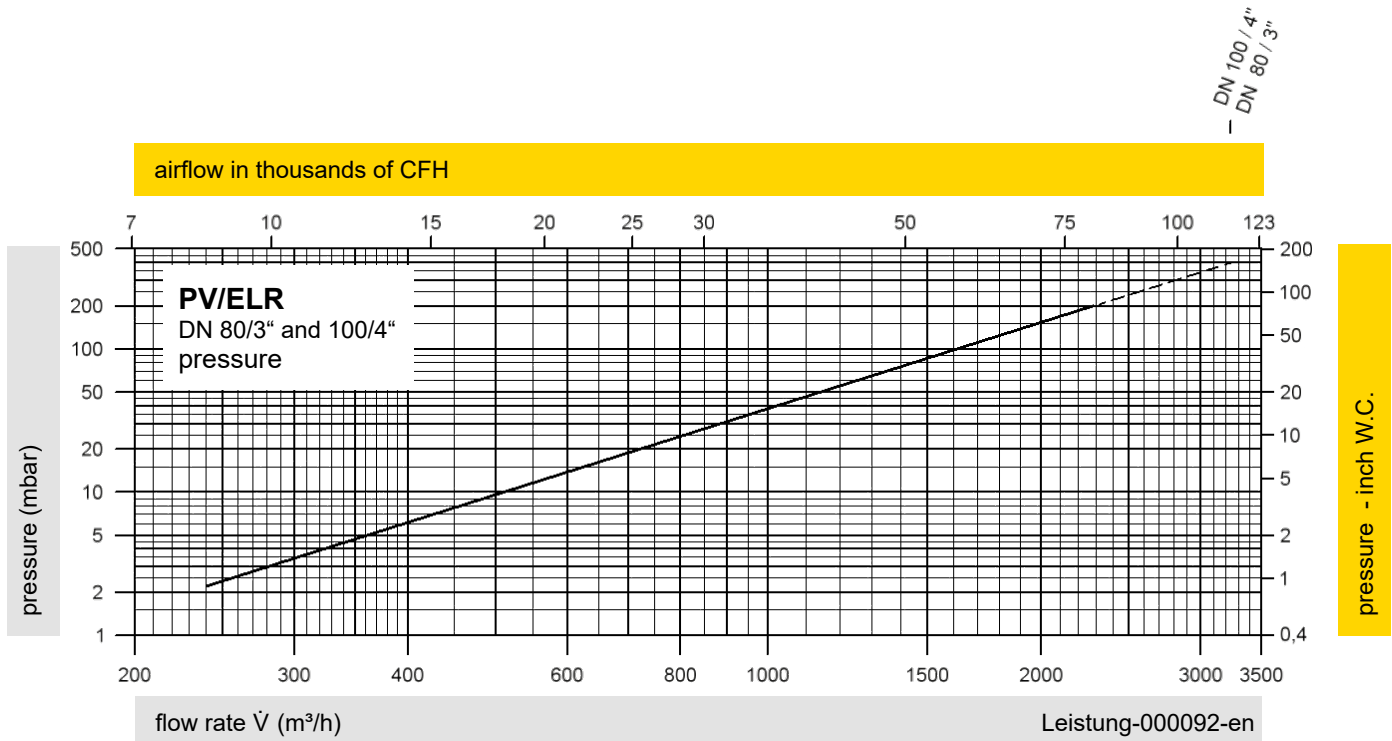
PROTEGO
for safety and environment



Pressure and Vacuum Relief Valve

Flow Capacity Charts

PROTEGO® PV/ELR



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."