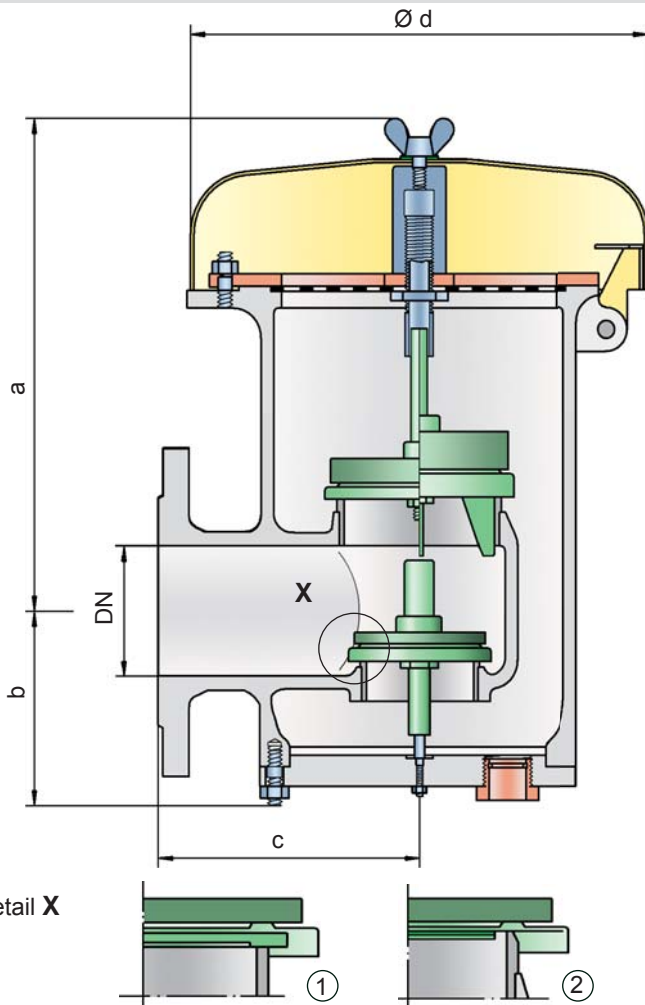


# Pressure and Vacuum Relief Valve

## PROTEGO® PV/ELR



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 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 media. After the excess pressure is discharged or the vacuum is compensated, 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
- extreme tightness and hence least possible product losses and reduced environmental pollution
- the set pressure is close to the opening pressure which results in best possible pressure management of the system
- high flow capacity
- the valve pallet is guided within the housing to protect against freezing in cold weather
- can be installed in explosion hazardous areas
- self-actuated condensate drain
- compact design saves space
- special design with lifting gear can be purchased
- maintenance friendly design

### Design Types and Specifications

The valve pallets are weight-loaded. At set pressures greater than 35 mbar ( 14 inch W.C.), an elongated construction 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 can be set for the valve. When the difference between the pressure and vacuum exceeds 150 mbar/60.2 inch W.C., special valve pallets are used.

### 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- and outbreathing 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 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

**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	Aluminium	Stainless Steel	Stainless Steel	Stainless Steel
Sealing	FEP	FEP	Metal to Metal	PTFE

Special material as well as  
higher set pressure upon  
request**Table 4: Material selection for vacuum valve pallet**

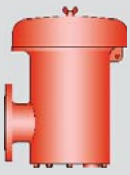
Design	A	B	C	D
Vacuum range (mbar) (inch W.C.)	-3.5 up to -5.0 -1.4 up to -2.0	<-3.5 up to -14 <-2.0 up to -5.6	<-14 up to -50 <-5.6 up to -20	<-14 up to -50 <-5.6 up to -20
Valve pallet	Aluminium	Stainless Steel	Stainless Steel	Stainless Steel
Sealing	FEP	FEP	Metal to Metal	PTFE

Special material as well as  
higher set vacuum upon  
request**Table 5: Flange connection type**

EN 1092-1; Form B1
ASME B16.5; 150 lbs RFSF

other types upon request

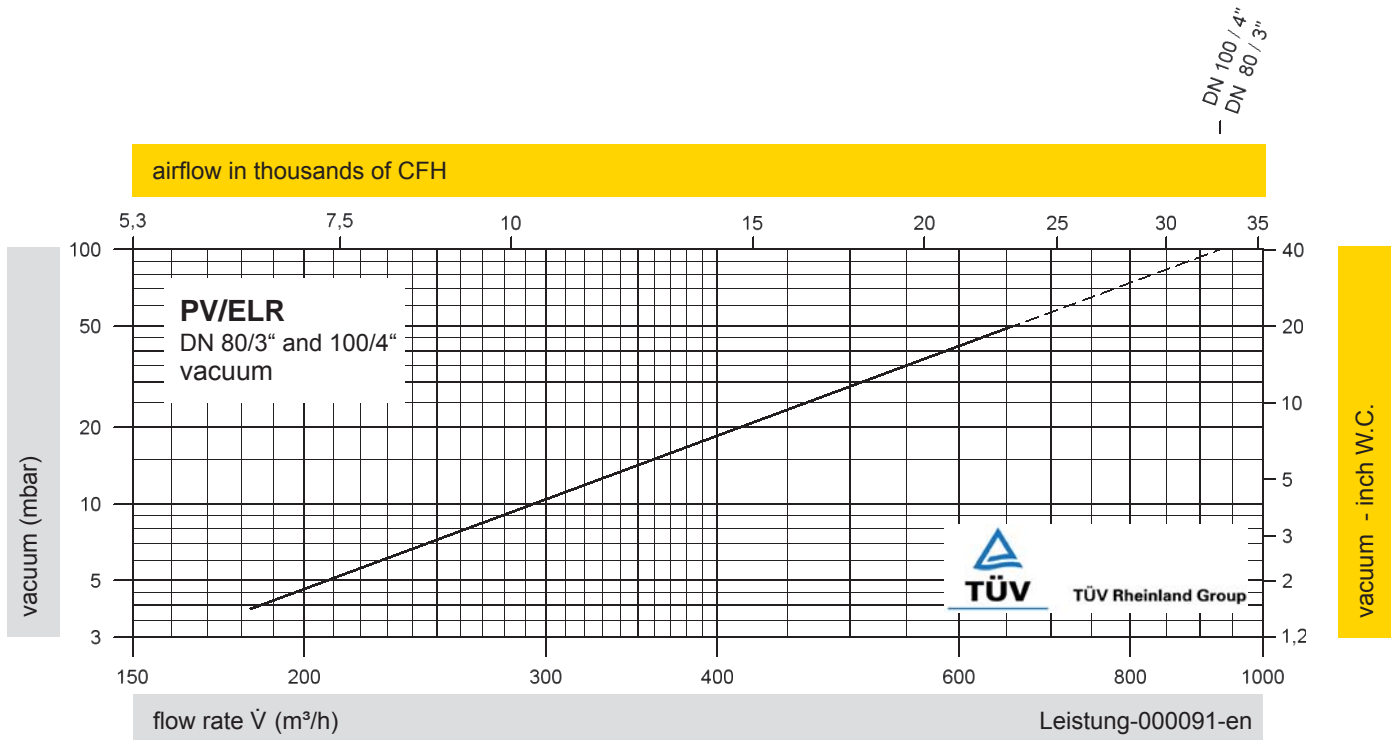
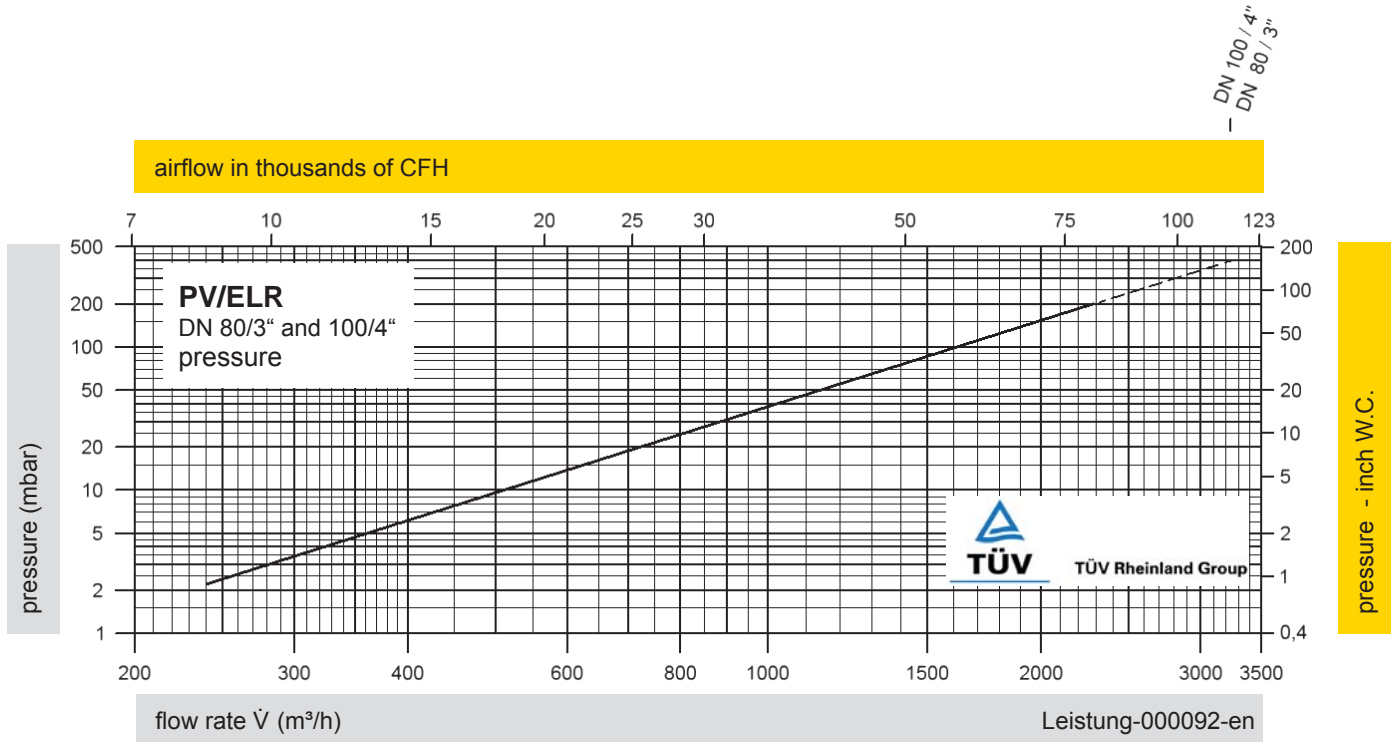




# Pressure and Vacuum Relief Valve

## 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 (m<sup>3</sup>/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".