**Settings:**

**pressure:**
- DN 80 +3.5 mbar up to +50 mbar
- +1.4 inch W.C. up to +20 inch W.C.
- DN 100 +3.5 mbar up to +45 mbar
- +1.4 inch W.C. up to +18 inch W.C.
- DN 150 +3.5 mbar up to +46 mbar
- +1.4 inch W.C. up to +18.4 inch W.C.

Higher pressure settings in special design with additional liquid reservoir upon request.

**vacuum:**
- -3.5 mbar; -5.0 mbar; -7.0 mbar
- -1.4 inch W.C.; -2.0 inch W.C.; -2.8 inch W.C.

Fixed settings

**Function and Description**

The PROTEGO® UB/SF-G diaphragm valve is the only deflagration-proof and endurance burning-proof valve of its kind in the world. It is a highly developed combined pressure and vacuum valve with a dynamic and static flame arrester. It is primarily used as a safety device for flame transmission-proof in-breathing and out-breathing of tanks, containers, and process equipment. The valve provides reliable protection against overpressure and vacuum, prevents the in-breathing of air and product losses almost up to the set pressure, and protects against atmospheric deflagration and endurance burning if stabilized burning occurs.

The PROTEGO® UB/SF-G diaphragm valve has proven itself over many years under a wide variety of operating conditions in the mineral oil and chemical industries. Worldwide, it is the only vent which works reliably with problem products such as styrene or acrylates. The set pressure is adjusted with a freeze resistant water-glycol mixture which ensures safe operation under extreme cold weather conditions. The valve type PROTEGO® UB/SF-G is used for those operating conditions, when heated product vapours condensate due to low ambient temperatures within the vacuum chamber (5) connected to the tank room. This would dilute the liquid load of the standard design type PROTEGO® UB/SF, whereas type PROTEGO® UB/SF-G allows the condensate to flow back into the tank via punched diaphragm.

The PROTEGO® UB/SF-G valve is available for substances up to explosion group II B3.

When the pressure in the tank reaches the set pressure, the diaphragm (1) on the outer valve seat ring (2) is lifted and vapors are released into the environment. The set pressure is adjusted by weight of the liquid load (water-glycol mixture) in the outer ring chamber (3). The overpressure chamber is equipped with an opening (4) to keep the pressure in balance. The opening is equipped with a FLAMEFILTER® to prevent flame transmission into the overpressure chamber. The overpressure is adjusted via the filling level of the load liquid in the chamber and can be checked by a floating level indicator (7).
Special Features and Advantages

- particularly suitable for problematic products such as styrene, acrylates, etc.
- protection against atmospheric deflagrations and endurance burning for products up to explosion group IIB3 (NEC group C MESG ≥ 0.65 mm)
- excellent tightness, resulting in lowest possible product losses and environmental pollution
- set pressure close to opening pressure for optimum pressure maintenance in the system
- high flow capacity
- can be used as a protective system in areas with potentially explosive atmospheres in accordance with ATEX
- minimum pressure loss due to the PROTEGO® flame arrester unit
- flame arrester venting and ventilation of the pressurized chamber
- optimal frost protection
- automatic condensate drain
- monitoring of the load liquid by a level indicator
- easy operation monitoring and maintenance by simply opening the hinged valve cap
- modular design enables replacement of individual FLAMEFILTER® discs and diaphragm

Design Types and Specifications

In overpressure ranges the valve is pressurized by liquid, whereas in underpressure ranges it is weight-loaded. Higher pressures are available upon request in a special version with an additional attachment.

There are two different designs:

- Pressure/vacuum diaphragm valve, basic design: UB/SF - G
- Pressure/vacuum diaphragm valve with heating coil (max. heating fluid temperature +85°C / 185°F): UB/SF - G - H

Separate data sheets are available for further requirements, e.g. PROTEGO® UB/SF-IIB3, UB/SF-IIA1.
### Table 1: Dimensions

Dimensions in mm / inches

<table>
<thead>
<tr>
<th>DN</th>
<th>Pressure 1</th>
<th>Pressure 2</th>
<th>Pressure 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>up to +28 mbar / 11.2 inch W.C.</td>
<td>up to +28 mbar / 11.2 inch W.C.</td>
<td>up to +25 mbar / 10 inch W.C.</td>
</tr>
<tr>
<td></td>
<td>615 / 24.21</td>
<td>645 / 25.39</td>
<td>660 / 26.77</td>
</tr>
<tr>
<td>a</td>
<td>&gt; +28 mbar / 11.2 inch W.C.</td>
<td>&gt; +28 mbar / 11.2 inch W.C.</td>
<td>&gt; +25 mbar / 10 inch W.C.</td>
</tr>
<tr>
<td></td>
<td>765 / 30.12</td>
<td>795 / 31.30</td>
<td>830 / 32.68</td>
</tr>
<tr>
<td>b</td>
<td>410 / 16.14</td>
<td>485 / 19.09</td>
<td>590 / 23.23</td>
</tr>
</tbody>
</table>

Pressure settings > +50 mbar / +20 inch W.C. (DN 80/3”), > +45 mbar / +18 inch W.C. (DN 100/4”), > +46 mbar / +18.4 inch W.C. (DN150/6”) with additional liquid reservoir - dimensions upon request.

Dimensions for pressure/vacuum diaphragm valves with heating coil upon request.

### Table 2: Selection of explosion group

<table>
<thead>
<tr>
<th>MESG</th>
<th>Expl. Gr. (IEC/CEN)</th>
<th>Gas Group (NEC)</th>
<th>Special approvals upon request.</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 0.65 mm</td>
<td>IIB3</td>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

### Table 3: Material selection for housing

<table>
<thead>
<tr>
<th>Design</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing</td>
<td>Steel</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>Valve top</td>
<td>Stainless Steel</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>Heating coil (UB/SF-H-...)</td>
<td>Stainless Steel</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>Valve seats</td>
<td>Stainless Steel</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>Gasket</td>
<td>FPM</td>
<td>PTFE</td>
</tr>
<tr>
<td>Diaphragm</td>
<td>A, B</td>
<td>A, B</td>
</tr>
<tr>
<td>Flame arrester unit</td>
<td>C</td>
<td>C</td>
</tr>
</tbody>
</table>

The housings are also available with an ECTFE coating. Special materials upon request.

### Table 4: Material selection for diaphragm

<table>
<thead>
<tr>
<th>Design</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diaphragm</td>
<td>FPM</td>
<td>FEP</td>
</tr>
</tbody>
</table>

Special materials upon request.

### Table 5: Material combinations of flame arrester unit

<table>
<thead>
<tr>
<th>Design</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLAMEFILTER® casing</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>FLAMEFILTER®</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>Spacer</td>
<td>Stainless Steel</td>
</tr>
</tbody>
</table>

Special materials upon request.

### Table 6: Flange connection type

<table>
<thead>
<tr>
<th>EN 1092-1; Form B1</th>
<th>ASME B16.5 CL 150 R.F.</th>
</tr>
</thead>
</table>

Other types upon request.

### Remark

\[
\text{set pressure} = \frac{\text{opening pressure resp. tank design pressure}}{1.4}
\]

Set pressure = the valve starts to open
Opening pressure = set pressure plus overpressure
Overpressure = pressure increase over the set pressure
The flow capacity charts have been determined with a calibrated and TÜV certified flow capacity test rig. Volume flow \( V \) 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.”
The flow capacity charts have been determined with a calibrated and TÜV certified flow capacity test rig.

Volume flow $V$ in (m²/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."

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Flow Capacity Charts - Pressure

PROTEGO® UB/SF-G-150

adjusted set pressure mbar/inch W.C.:

airflow in thousands of CFH

UB/SF-G-150-IIB3 - pressure
set pressure from +3.5 up to 25 mbar / +1.4 up to 10 inch W.C.
interpolate intermediate sizes

flow rate V (m³/h)
The flow capacity charts have been determined with a calibrated and TÜV certified flow capacity test rig.

Volume flow \( V \) 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."
Flow Capacity Chart - Vacuum

Pressure/Vacuum Diaphragm Valve

PROTEGO® UB/SF-G-150

Airflow in thousands of CFH

Pressure difference \( \Delta p \) in mbar

Flow rate \( V \) (m³/h)

Pressure difference \( \Delta p \) - inch W.C.

\[ \text{pressure difference} = \text{max. allowable tank design vacuum} - \text{valve set vacuum} \]

Adjusted set vacuum:

- \( \leq -5 \text{ mbar} / \leq -2 \text{ inch W.C.} \)
- \( > -5 \text{ mbar up to} \leq -7 \text{ mbar} / > -2 \text{ inch W.C. up to} \leq -2.8 \text{ inch W.C.} \)