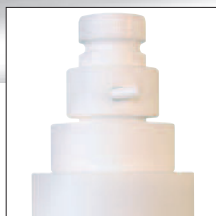
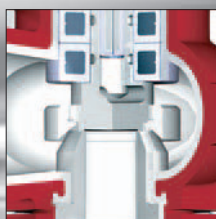
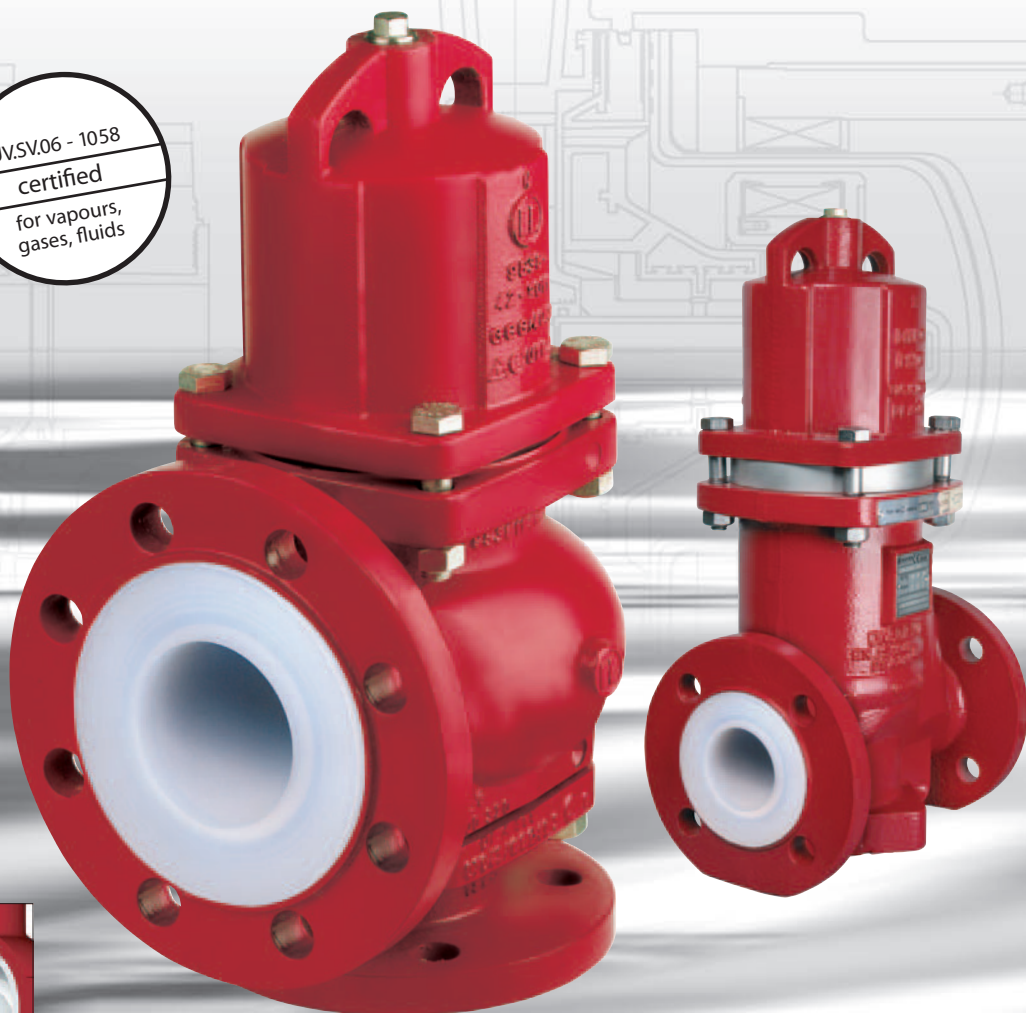
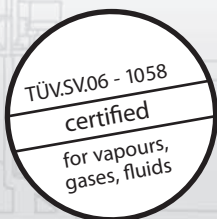


# Richter Low-Pressure Safety Valves

for gauge pressure and vacuum

LPV



Thick-walled PFA/PTFE lining

Hermetically tight

Set pressures from  
-120 mbar to +120 mbar  
(-1.7 psi to +1.7 psi)

-60 to +200 °C (-75 to +400 °F)



**RICHTER**  
Process Pumps & Valves

**IDEX**  
FLUID & METERING

## Richter low-pressure safety valve

### Fields of application

The direct-acting overflow valve of the LPV series is designed for use with corrosive and pure liquids, gases and vapours. In process plants it is used

- in the range from -120 mbar (-1.7 psi) vacuum up to +120 mbar (+1.7 psi) gauge pressure at temperatures of up to 200 °C (400 °F)
- for venting during filling
- for respiration during emptying
- in the case of process or temperature-related volume variations
  - in reactor columns
  - in vessels with glass or plastic lining or made of Hastelloy®, titanium etc. or borosilicate glass
  - in vessels with protective gas layers

The LPV can be installed as an **angle valve** on a vessel or as an **inline valve** in a pipe.

### Product features

The LPV series offers plant operators major advantages:

The **set pressure** can be **adapted to suit subsequent changes in operating parameters** by the addition/removal of weights.

The LPV is gas and liquid-tight to DIN EN 12266-1, bubble-tight.

**Compromise solutions**, e.g. ball check valves, **are no longer necessary**.

### Other features:

- direct-acting, weight-loaded
- proportional opening characteristic
- top-entry design, very easy maintenance
- wetted surfaces anti-adhesive thanks to PFA/PTFE
- Body PN 16, flanges ISO 7005-2 type B PN 16 (formerly DIN 2532/33), on request drilled to ANSI B16.5 Cl.150, BS, JIS
- Installation: valve bonnet vertical
- Identification to DIN EN 19, ANSI B16.34

### Type codes

- Angle valve LPV-A/...
- Inline valve LPV-D/...

### Lining

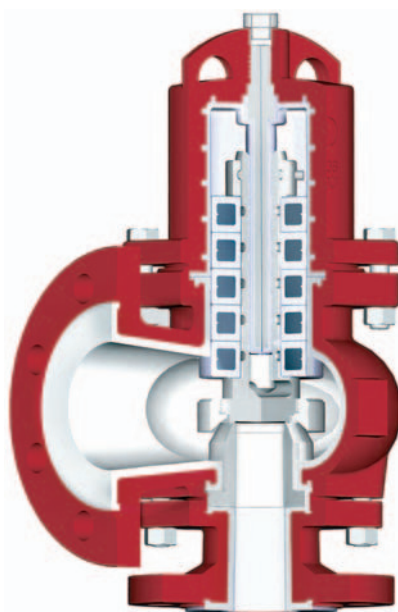
- PFA and PTFE .../F
- Antistatic PFA-L/PTFE-L .../F-L
- Highly permeation-resistant PFA-P (only LPV/D) .../F-P

- ① **Body, inlet nozzle and bonnet made of ductile cast iron EN-JS 1049/ASTM A395**
  - absorb system and pipe forces
  - accurate centering through metallic fits
- ② **Maintenance-friendly: seat and plug can be replaced individually**

The lifting aid promotes response characteristic, close function tolerances even at very low set pressures.
- ③ **Hermetically tight against the atmosphere:**

Closed bonnet, seamless lining
- ④ **Simple, fast and accurate adjustment of the set pressure**
  - Vapours/gases/liquids: certified in the range of
    - set pressure **+20 mbar to +120 mbar (+0.3 psi to +1.7 psi)**
    - set vacuum **-20 mbar to -120 mbar (-0.3 psi to -1.7 psi)**
    - other pressures on request
    - Certification No. TÜV.SV.06-1058

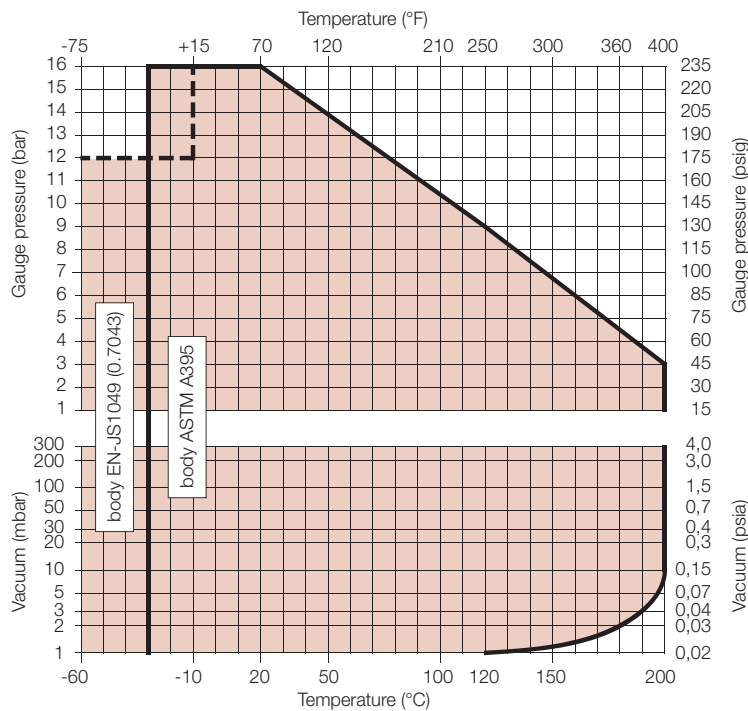
For more detailed information, see VdTÜV information sheet 1058
  - Weights can be varied in 5, 10 and 20 mbar (0.07, 0.15 and 0.30 psi) increments, also possible after installation and in the operator's workshop.
  - Stainless steel core in guide ensures **dimensional stability even at high temperatures**. Core of the guide optionally Hastelloy® C4 (2.4610)



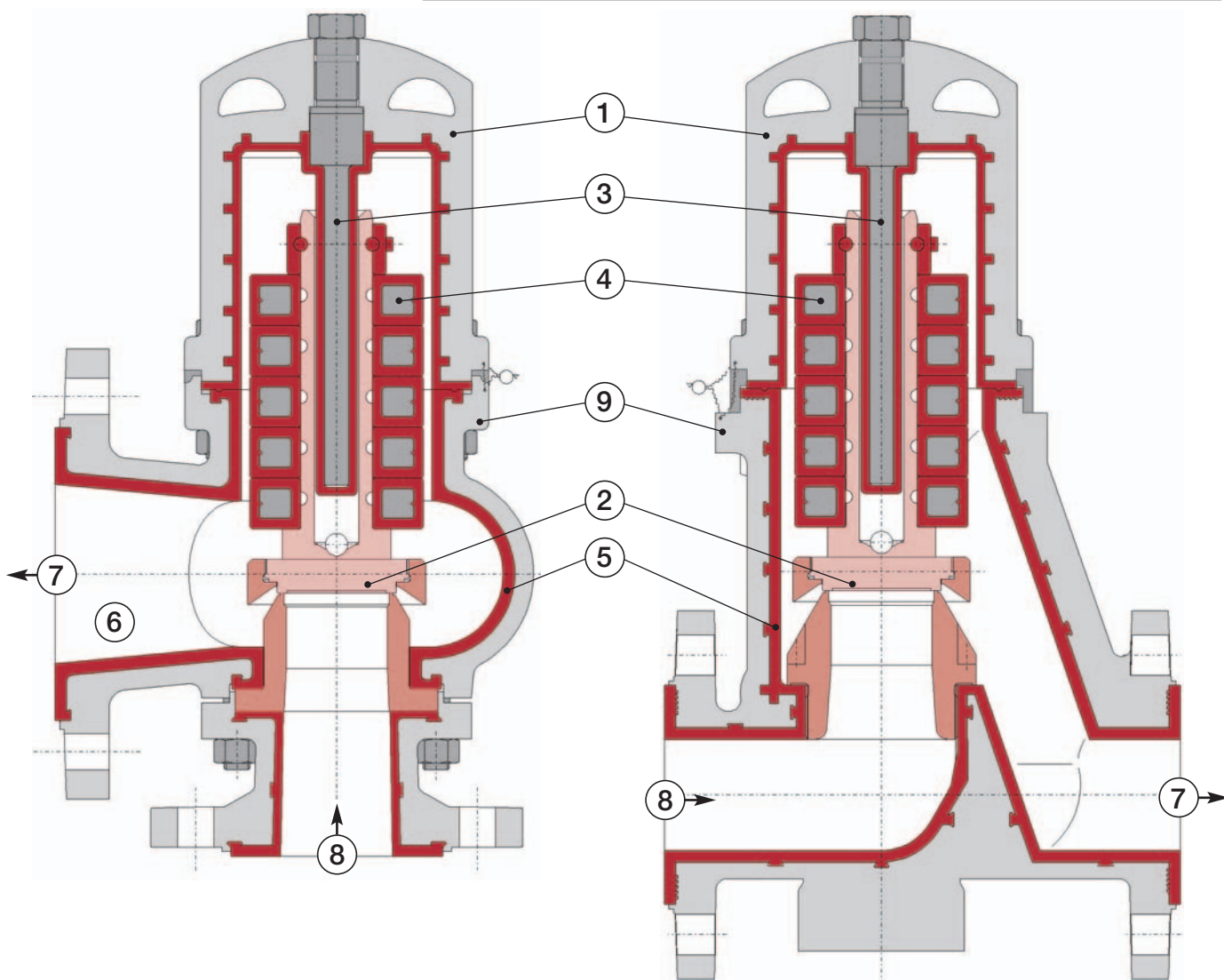
Angle valve LPV-A

- ⑤ **Thick-walled lining made of virgin, pure PFA/PTFE**
  - high permeation resistance
  - vacuum-proof anchored
  - conductive or highly permeation-resistant lining optional
  - universal application for highly corrosive, pure, hot and highly permeating media, also in multi-purpose and pilot plants
- ⑥ Divergent outlet, therefore self-draining, almost **no medium residue in the valve body**
- ⑦ Vessel connection for vacuum application
- ⑧ Vessel connection for gauge pressure application
- ⑨ **External corrosion protection:**  
Epoxy coating, nuts and bolts made of stainless steel

#### Pressure/temperature range



For low-temperature applications please observe the local regulations!



Low pressure overflow valve LPV-A as angle valve

Low pressure overflow valve LPV-D as inline valve

# Materials, Dimensions, Weights

## Components and materials

| Item    | Designation          | Material                                                       |
|---------|----------------------|----------------------------------------------------------------|
| 100     | Body                 | Ductile cast iron EN JS 1049/ASTM A395, lining* PFA resp. PTFE |
| 112     | Bonnet               | Ductile cast iron EN JS 1049/ASTM A395, lining* PFA            |
| 122     | Inlet nozzle         | Ductile cast iron EN JS 1049/ASTM A395, lining* PFA            |
| 204     | Plug                 | PTFE, optionally antistatic                                    |
| 205     | Seat                 | PTFE, optionally antistatic                                    |
| 237     | Lifting aid          | PTFE, optionally antistatic                                    |
| 239     | Weights              | 5 mbar (0.07 psi)                                              |
|         |                      | 10 mbar (0.15 psi)                                             |
|         |                      | 20 mbar (0.29 psi)                                             |
| 522     | Round cord           | PTFE                                                           |
| 544     | Support ring         | PTFE                                                           |
| 549     | Centering ring       | Stainless steel                                                |
| 801     | Guide                | PFA*, core stainless steel, optionally: core Hastelloy® C      |
| 937     | Lead seal            | Plastic                                                        |
| 938     | Hex. head screw plug | Stainless steel                                                |
| w/o no. | Body screw           | Stainless steel, other materials on request                    |

\* antistatic resp. highly permeation-resistant lining on request

## Discharge coefficient

| LPV-A         |                        |                     |                        |                        | LPV-D         |                        |                     |                        |                        |
|---------------|------------------------|---------------------|------------------------|------------------------|---------------|------------------------|---------------------|------------------------|------------------------|
| Nom. diameter | h/d <sub>0</sub> ≥ ... | Valve lift min (mm) | Discharge coefficient* | Flow-Ø mm <sup>2</sup> | Nom. diameter | h/d <sub>0</sub> ≥ ... | Valve lift min (mm) | Discharge coefficient* | Flow-Ø mm <sup>2</sup> |
| DN 50/80      | 0.32                   | 14.4                | 0.5                    | 1590                   | DN 50         | 0.2                    | 9                   | 0.3                    | 1590                   |
| DN 80/100     | 0.32                   | 19.2                | 0.5                    | 2827                   | DN 80         | 0.2                    | 12                  | 0.3                    | 2827                   |
| DN 100/150    | 0.32                   | 28.8                | 0.5                    | 6362                   | DN 100        | 0.2                    | 18                  | 0.3                    | 6362                   |

\* with an opening pressure difference of ≤ 15 %

Discharge capacities for air at 20 °C and 1013 mbar (68 °F and 14.7 psi) and water 20 °C (68 °F) at 0 bar (0 psi) back pressure

| LPV-A                   |                                      |              |                                      |              |                                      |              | LPV-D                   |                                      |              |                                      |              |                                      |              |
|-------------------------|--------------------------------------|--------------|--------------------------------------|--------------|--------------------------------------|--------------|-------------------------|--------------------------------------|--------------|--------------------------------------|--------------|--------------------------------------|--------------|
| Set pressure mbar (psi) | DN 50/80 (2"/3")                     |              | DN 80/100 (3"/4")                    |              | DN 100/150 (4"/5")                   |              | Set pressure mbar (psi) | DN 50 (2")                           |              | DN 80 (3")                           |              | DN 100 (4")                          |              |
|                         | Air (m <sub>N</sub> <sup>3</sup> /h) | Water (kg/h) | Air (m <sub>N</sub> <sup>3</sup> /h) | Water (kg/h) | Air (m <sub>N</sub> <sup>3</sup> /h) | Water (kg/h) |                         | Air (m <sub>N</sub> <sup>3</sup> /h) | Water (kg/h) | Air (m <sub>N</sub> <sup>3</sup> /h) | Water (kg/h) | Air (m <sub>N</sub> <sup>3</sup> /h) | Water (kg/h) |
| 10 (0.145)              | 108                                  | 4047         | 192                                  | 7196         | 432                                  | 16195        | 10 (0.145)              | 64                                   | 2428         | 115                                  | 4318         | 259                                  | 9717         |
| 20 (0.290)              | 152                                  | 5724         | 271                                  | 10177        | 610                                  | 22904        | 20 (0.290)              | 91                                   | 3434         | 162                                  | 6106         | 366                                  | 13742        |
| 40 (0.580)              | 215                                  | 8095         | 383                                  | 14393        | 863                                  | 32391        | 40 (0.580)              | 129                                  | 4857         | 230                                  | 8636         | 517                                  | 19435        |
| 60 (0.870)              | 264                                  | 9914         | 469                                  | 17628        | 1056                                 | 39671        | 60 (0.870)              | 158                                  | 5948         | 281                                  | 10577        | 633                                  | 23802        |
| 80 (1.160)              | 304                                  | 11448        | 541                                  | 20355        | 1218                                 | 45808        | 80 (1.160)              | 182                                  | 6869         | 325                                  | 12213        | 731                                  | 27485        |
| 100 (1.145)             | 340                                  | 12800        | 605                                  | 22758        | 1361                                 | 51215        | 100 (1.145)             | 204                                  | 7679         | 363                                  | 13654        | 817                                  | 30729        |
| 120 (1.740)             | 372                                  | 14021        | 662                                  | 24930        | 1490                                 | 56104        | 120 (1.740)             | 223                                  | 8412         | 397                                  | 14958        | 894                                  | 33662        |

set pressure = opening pressure - back pressure

m<sub>N</sub><sup>3</sup>/h = standard cubic metre at 20 °C, 1013 mbar (68 °F and 14.7 psi)

## Connecting and installation dimensions, weights

|                 |                 |     |                |                |                |                |                 |                 |     |                |                |     | flange bore ISO 7005-R.1 PN 16 |                |                  |                  | flange bore ANSI B16.5 Cl.150 |                |                  |                  | LPV-A | LPV-D |
|-----------------|-----------------|-----|----------------|----------------|----------------|----------------|-----------------|-----------------|-----|----------------|----------------|-----|--------------------------------|----------------|------------------|------------------|-------------------------------|----------------|------------------|------------------|-------|-------|
| DN <sub>1</sub> | DN <sub>2</sub> | L   | H <sub>1</sub> | H <sub>2</sub> | d <sub>0</sub> | d <sub>4</sub> | d <sub>41</sub> | d <sub>42</sub> | S   | S <sub>1</sub> | S <sub>2</sub> |     | K <sub>1</sub>                 | K <sub>2</sub> | nxd <sub>1</sub> | nxd <sub>2</sub> | K <sub>1</sub>                | K <sub>2</sub> | nxd <sub>1</sub> | nxd <sub>2</sub> | kg    | kg    |
| 50 (2")         | 80 (3")         | 127 | 338            | 238            | 45             | 102            | 102             | 138             | 230 | 125            | 125            | 125 | 160                            | 4x18           | 8x18             | 120.6            | 152.4                         | 4x19           | 4x19             | 26               | 23    |       |
| 80 (3")         | 100 (4")        | 147 | 478            | 267            | 60             | 138            | 140             | 158             | 310 | 155            | 155            | 160 | 180                            | 8x18           | 8x18             | 152.4            | 190.5                         | 4x19           | 8x19             | 39               | 60    |       |
| 100 (4")        | 150 (5")        | 187 | 488            | 335            | 90             | 158            | 157             | 214             | 350 | 200            | 220            | 180 | 240                            | 8x18           | 8x22             | 190.5            | 241.3                         | 8x19           | 8x22             | 72               | 59    |       |

