INSTALLATION AND OPERATING MANUAL

Series LPV/F

Low-Pressure Safety Valves

for gauge and low pressure
with certification
Angle valve LPV-A/F
Inline valve LPV-D/F

Keep for future use!

This operating manual must be strictly observed before transport, installation, operation and maintenance

9530-060-en Revision 01 Edition 02/2009

RICHTER
Process Pumps & Valves

List of Contents

Relevant documents

- Data sheet
- Declaration of conformity
- Form for Safety Information Concerning the Contamination QM 0912-16-2001_en
- Drawing of weights 9530-00-4070

On request:

- VDTÜV data sheet "Safety valve 100" in German
- VdTÜV data sheet "Certified Chemical Safety Valves 1058" in German

1 Technical data

Manufacturer :

Richter Chemie-Technik GmbH
Otto-Schott-Str. 2
D-47906 Kempen
Telephone: +49 (0) 2152 146-0
Fax: +49 (0) 2152 146-190
E-Mail: richter-info@idexcorp.com
Internet: www.richter-ct.com

Designation :

Direct-acting low-pressure safety valve, weight-loaded

Certified for vapours/gases **and** liquids:
Certification number TÜV SV 01 -1058

Series **LPV-A/F** design angle valve
Series **LPV-D/F** design inline valve

Certified to Clean Air Act (TA Luft)

Strength and tightness (P10, P11) of the pressure-bearing body tested to DIN EN 12266-1.

Gas-tight (P12) in the seat to DIN EN 12266-1, leak rate A

Face to face LPV-A/F DN 50/80 and 80/100,
DIN EN 558-1 basic series 8, ISO 5752 series 8

Face to face LPV-D/F:
DIN EN 558-1 basic series 8, ISO 5752 series 1

Flange connecting dimensions: DIN EN 1092-2, type B (ISO 7005-2 Type B) PN 16 or flanges drilled to ASME B16.5 Class 150

Materials :

Body material: Ductile cast iron EN-JS 1049 to DIN EN 1563 (0.7043 DIN 1693)

Lining material: PFA/PTFE .../F
On request: antistatic .../F-L

Test pressure :

LPV-A/F, LPV-D/F all nominal sizes	
Test gauge pressure	+20 to +120 mbar
Test low pressure	–20 to –120 mbar

Fine adjustment in 5 mbar steps is possible by adding/removing weights.

Temperature range : 60 °C to +200 °C

See pressure-temperature diagram in Section 1.5.

Valve size inlet/outlet in mm:

LPV-A/F 50/80, 80/100, 100/150
LPV-D/F 50, 80, 100

Weight: (figures without weights) :

LPV-A/F	50/80	ca. 26 kg
LPV-A/F	80/100	ca. 39 kg
LPV-A/F	100/150	ca. 72 kg
LPV-D/F	50	ca. 23.1 kg
LPV-D/F	80	ca. 60.2 kg
LPV-D/F	100	ca. 59.4 kg

Dimensions and individual parts :

LPV-A/F see Section 10.3 and 10.5
LPV-DF see Section 10.4 and 10.6

Installation position : vertical

A direction arrow on the shell indicates the direction of flow. See Section 6.6.

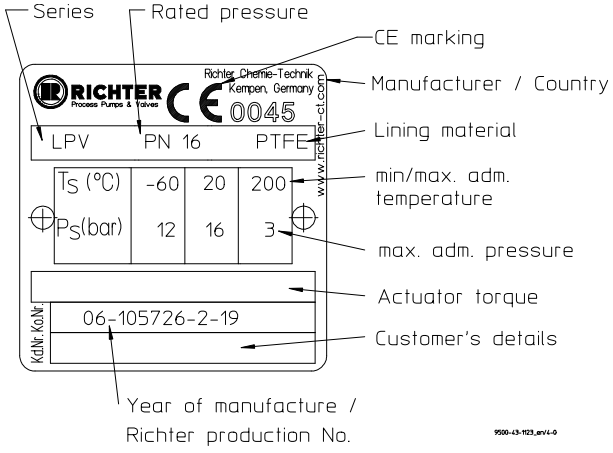
1.1 Type plate, CE and body markings

The stainless steel name plate is undetachably riveted to the body.

Another stainless steel name plate firmly riveted to the valve indicates the test gauge pressure.

If the operator attaches his identification, it must be ensured that the valve matches the application in question.

Example of name plate with CE marking:



Body identification:

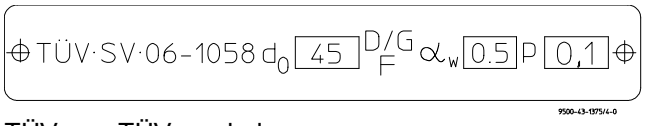
The following are visible on the body according to DIN EN 19 and AD 2000 A4:

- Nominal size
- Rated pressure
- Body material
- Manufacturer's identification
- Melt number/Foundry identification
- Cast date
- Arrow for direction of flow

1.2 Component identification

Certified low-pressure safety valves LPV-A/F and LPV-D/F are identified with a certification plate to the German data sheet A2. This stainless steel plate is riveted to the valve body.

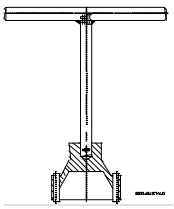
It contains the following details for example:



TÜV = TÜV symbol
SV = Safety valve
06 = Year of certification (here: 2006)
1058 = Certification number (here: 1058)
d0 = Narrowest flow Ø in mm (here: 45)
D/G = intended for discharging vapours/gases
F = intended for discharging liquids
= Certified coefficient of discharge (here: 0,5 for D/G and F)
p = Einstellüberdruck in bar (hier: 0,1)

1.3 Screw-in tools for seats

Nominal size [mm]	Nominal size [inch]	Article No.
50	2“	9568-96-1016
80	3“	9568-96-1017
100	4“	9568-96-1018



1.4 Tightening torques

All screws greased, tighten in diametrically opposite sequence!

The tightening torques for pipe screws and body screws mentioned must not be exceeded. For an exception, see **Section 8**, Flange connection valve / pipe is leaking.

The following tightening torques are recommended.

Pipe screws, flanges to DIN/ISO

Flange Nominal size [mm]	Screws [ISO/DIN]	Tightening torque [Nm]
25	4 x M 12	10
50	4 x M 16	26
80	8 x M 16	25
100	8 x M 16	35
150	8 x M 20	65

Pipe screws, DIN/ISO flanges drilled to ASME

Flange Nominal size [mm]	Flange Nominal size [inch]	Screws [ASME]	Tightening torque [Nm]	Tightening torque [in-lbs]
25	1"	4 x ½“	8	70
50	2"	4 x ⅝“	25	220
80	3"	8 x ⅝“	45	400
100	4"	8 x ⅝“	35	310
150	6"	8 x ¾“	80	710

Screws for body / inlet nozzle

Valve type	Screws	Tightening torque [Nm]	Tightening torque [in-lbs]
LPV-A 50/80	4 x M 12	25	220
LPV-A /100	8 x M 10	20	177
LPV-A 100/150	8 x M 16	25	220

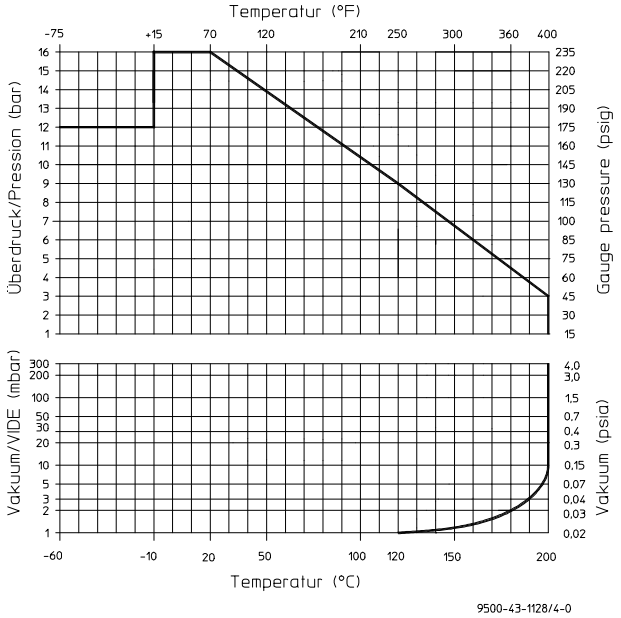
Screws for body / bonnet

Valve type	Screws	Tightening torque [Nm]	Tightening torque [in-lbs]
LPV-A 50/80, LPV-D 50	4 x M 12	25	220
LPV-A 80/100	4 x M 12		
LPV-A 100/150	8 x M 12		
LPV-D 80	8 x M 12		
LPV-D 100	8 x M 12		

1.5 Pressure-temperature-diagram

When used in the minus temperature range, the regulations applicable in the country in question must be observed.

The diagram shows the max. admissible pressure/ temperature load of the body.


Temperatur (°F)
-75
+15
70
120
210
250
300
360
400
Überdruck/Pression (bar)
Gauge pressure (psig)
Vakuum/VIDE (mbar)
Vakuum (psia)
Temperatur (°C)
-60
-10
20
50
100
120
150
200
9500-43-1128/4-0

2 Notes on safety

This operating manual contains fundamental information which is to be observed during installation, operation and maintenance.
It must be read before installation and commissioning!

For low-pressure safety valves which are used in potentially explosive areas, see **Section 3**.

Installation, operation and maintenance are to be performed by qualified staff.

The area of responsibility, authority and supervision of the staff must be regulated by the customer.

General hazard symbol!
People may be put at risk.

Safety symbol! The ball valve and its function may be put at risk if this safety symbol is not observed.

It is imperative to observe warnings and signs attached directly to the valve and they are to be kept fully legible.

Non-observance of the notes on safety may result in the loss of any and all claims for damages.

Non-observance may involve the following hazards :

- Failure of important functions of the valve/plant.
- Risk to people from electric, mechanical and chemical effects.
- Risk to the environment through leaks of hazardous substances.

2.1 Intended use

Richter low-pressure safety valves of the series LPV-A/F and LPV-D/F are pressure-maintaining components with safety function in accordance with the Pressure Equipment Directive (DGRL). They protect the pressure equipment if the admissible pressure limit is exceeded.

The valves are suitable for vapours, gases and non-boiling liquids of group 1 according to the PED and have a corrosion-resistant plastic lining.

The valves are used to

- fill and empty tanks (aeration)
- to protect lined vessels against vacuum.
- to protect vessels with a layer of nitrogen.
- to protect reactor columns.

If the **gauge pressure** function is desired, the valve is connected to the pressure system with the inlet flange. In the case of the **low-pressure** function the valve is connected to the pressure system with the outlet flange.

If the medium contains solids, the manufacturer must be consulted on whether the valve is suitable for the application in question.

Solids can lead to increased wear, damage to sealing surfaces or to a reduction in the service life of the valve.

Low-pressure safety valves have been set at the works to the desired test pressure, tested and lead-sealed.

If the operating parameters are subsequently changed, the set pressure can be modified by adding/removing weights, see **Section 6.5 and 9.4**.

In case of the valve is intended for operating data other than those intended, the customer must carefully examine whether the design of the valve, accessories and materials are suitable for the new application. Please consult the manufacturer.

2.2 For the customer / operator

If a low-pressure safety valve is used, the operator must ensure that

- hot or cold valve parts are protected by the customer against being touched
- the valve has been properly installed in the pipe system
- the operating conditions stipulated in the data sheet are not exceeded in continuous operating mode.

This is not the manufacturer's responsibility.

Loads caused by earthquakes were not allowed for in the design.

Fire protection to DIN EN ISO 10497 is not possible (plastic lining and plastic components).

2.3 Improper operation

The operational safety of the valve supplied is only guaranteed if it is used properly in accordance with **Section 2.1** of this operating manual.

The operation limits specified on the name plate and in the pressure-temperature diagram must under no circumstances be exceeded.

See also improper operation and their consequences in **Section 7.4**.

3 Safety notes for applications in potentially explosive areas based on the Directive 94/9/ EC (Atex 95)

The valves are intended for use in a potentially explosive area and are therefore subject to the conformity assessment procedure of the directive 94/9/EC (ATEX).
As part of this conformity assessment, an ignition hazard analysis to EN 13463-1 to satisfy the fundamental safety and health requirements was conducted with the following result:

- **The valves do not have any ignition source of their own.**
- **The valves are not covered by the scope of application of the ATEX directive and therefore do not need to be identified accordingly.**
- **The valves may be used in a potentially explosive area.**

It is imperative to observe the individual points of intended use for application in a potentially explosive area.

3.1 Intended use

Improper operation, even for brief periods, may result in serious damage to the valve.

In connection with explosion protection, potential sources of ignition (overheating, electrostatic and induced charges, mechanical and electric sparks) can result from these inadmissible modes of operation; their occurrence can only be prevented by adhering to the intended use.

Furthermore, reference is made in this connection to the Directive 95/C332/06 (ATEX 118a) which contains the minimum regulations for improving the occupational health and safety of the workers who may be at risk from an explosive atmosphere.

A difference is made between two cases for the use of chargeable liquids (conductivity < 10^{-8} S/m):

1. Chargeable liquid and non-conductive lining

Charges can occur on the lining surface. As a result, this can produce discharges inside the valve. However, these discharges cannot cause ignitions if the valve is completely filled with medium.

If the valve is not completely filled with medium, e.g. during evacuation and filling, the formation of an explosive atmosphere must be prevented, e.g. by superimposing a layer of nitrogen.

It is recommended to wait 1 hour before removing the valve from the plant in order to permit the elimination of static peak charges.

This means that, to safely prevent ignitions, the valve must be completely filled with medium at all times or else a potentially explosive atmosphere must be excluded by superimposing a layer of inert gas.

2. Chargeable liquid and conductive lining

No hazardous charges can occur as charges are discharged direct via the lining and shell (surface resistance <10^9 Ohm, leakage resistance <10^6 Ohm).

Static discharges of non-conductive linings are only produced through the interaction with a non-conductive medium and are therefore the responsibility of the plant operator.

Static discharges are not sources of ignition which stem from the valves themselves!

- The temperature of the medium must not exceed the temperature of the corresponding temperature class or the maximum admissible medium temperature as per the operating manual.
- If the valve is heated (e.g. heating jacket), it must be ensured that the temperature classes prescribed in the Annex are observed.
- To achieve safe and reliable operation, it must be ensured in inspections at regular intervals that the valve is properly serviced and kept in technically perfect order.
- Increased wear to the valve can be expected with the conveyance of liquids containing abrasive constituents. The inspection intervals should be reduced compared with the usual times.
- Actuators and electric peripherals, such as temperature, pressure and flow sensors etc., must comply with the valid safety requirements and explosion protection provisions.
- The valve must be grounded.
  This can be achieved in the simplest way via the pipe screws using tooth lock washers.
  Otherwise grounding must be ensured by different measures e.g. a cable link.
- Plastic-lined valves must not be operated with carbon disulphide

4 Safety note for valves, certified to Clean Air Act (TA-Luft)

On request, this valve can be supplied compliant with the German Clean Air Code.
Certificate / Manufacturer Declaration Validity is dependent on the operating instructions being read and observed.

In particular, servicing must be conducted at regular intervals, and the bolted connections relevant for tightness must be inspected and retightened if necessary.

5 Transport, storage and disposal

It is imperative, for all transport work, to observe generally accepted engineering practice and the accident prevention regulations.

The valve is supplied with flange caps. Do not remove them until just before installation. They protect the plastic surfaces against dirt and mechanical damage.

Handle the goods being transported with care. During transport the valve must be protected against impacts and collisions.

Directly after receipt of the goods, the consignment must be checked for completeness and any in-transit damage.

Do not damage paint protection.

5.1 Storage

If the valve is not installed immediately after delivery, it must be put into proper storage.

The product should be stored in a dry and vibration-free, well ventilated room at as constant a temperature as possible.
Elastomers are to be protected against UV light.
In general, a storage period of 10 years should not be exceeded.

Store the valve in an upright position and secure it from falling over!

In case of prolonged storage individual packing with a desiccant may be necessary. Pay attention to local site.

5.2 Return consignments

Valves which have conveyed aggressive or toxic media must be well rinsed and cleaned before being returned to the manufacturer's works.

It is **imperative** to enclose a **safety information sheet / general safety certificate** on the field of application with the return consignment.

Pre-printed forms are enclosed with the installation and operating manual.

Safety precautions and decontamination measures are to be mentioned.

5.3 Disposal

Parts of the valve may be contaminated with medium which is detrimental to health and the environment and therefore cleaning is not sufficient.

Risk of personal injury or damage to the environment due to the medium!

- Wear protective clothing when work is performed on the valve.
- Prior to the disposal of the valve:
  - Collect any medium, etc. which has escaped and dispose of it in accordance with the local regulations.
  - Neutralise any medium residues in the valve.
- Separate valve materials (plastics, metals, etc.) and dispose of them in accordance with the local regulations.

6 Installation

The installation conditions to the AD 2000 Code A2 (on pressure vessels) and TRD721 are to be observed. They are major preconditions for the safe operation of the valve.

- Examine valve for in-transit damage, damaged low-pressure safety valves must not be installed.
- Before installation the valve and the connecting pipe must be carefully cleaned to remove any dirt, especially hard foreign matter.
  Solids jeopardise the soft, plastic, high-precision sealing surfaces of the seat and plug and permanent leaks of the valve may occur.
- During installation, pay attention to the correct tightening torque, aligned pipes and tension-free assembly.
- Temperature-related changes in length of the pipes must be allowed for, e.g. by installing expansion joints.
- Remove flange caps.
- Position and align the valve. Then tighten the pipe screws with a torque wrench in diametrically opposite sequence.
  For tightening torques, see **Section 1.4**.

6.1 Sizing of the outlet line

The admissible pressure loss in the inlet line must not exceed 3% of the set pressure of the low-pressure safety valve.

The determination of the pressure loss relates to the maximum flow of the valve at 110% of the set pressure and 110% of the certified coefficient of discharge.

- An excessive pressure loss at the inlet of the low-pressure safety valve can cause rapid opening and reseating of the valve or chattering.
- Chattering results in a reduction in the discharge capacity and may cause an inadmissible rise in pressure in the system and damage to the seat sealing surfaces.
- **The inlet line must never be smaller than the nominal diameter of the safety valve inlet.**
- Lay supply lines as short as possible.
- Install, if at all possible, the valve directly on the container to be protected.
- At least chamfer the container nozzle in the inlet or even better provide with a radius.
- An inlet nozzle with a tapered design has the best shape in terms of flow.

6.2 Sizing of the outlet line

Outlet lines are to be sized so that reliable functioning of the valve is ensured under all expected operating conditions.

The medium is to be discharged so that there is no risk to people and the environment. The statutory provisions (e.g. accident prevention regulations, and the equivalents of the German Pollution Control Act or the German Clean Air Code) as well as local regulations (works standards) are to be observed.

- There must be no possibility of the safety valves becoming ineffective due to shut-off elements.

6.2.1 Admissible back pressure

- **The outlet line must never be smaller than the nominal diameter of the low-pressure safety valve outlet.**
- The max. admissible back pressure is 15% of the test gauge pressure. It must not be exceeded. A reduction in the blowdown capacity is thus avoided.

6.2.2 Drainage of condensate

Lay horizontal pipes with a gradient away from the valve so that the liquid medium cannot accumulate in the valve body and that, in the case of gases, no condensate collects in the body.

If outlet lines are laid with a geodetic level difference (e.g. for vapours or gases with a 90° vertical upright pipe bend out of the valve), the bend must not be located directly downstream of the valve.

A horizontal pipe section with a gradient must firstly be installed downstream of the valve.

A draining facility must be provided at the lowest point in the pipe. This opening for the drainage of condensate must be lower than the flow chamber of the body.

Lines for the drainage of condensate are to have adequate cross sections. They are to be laid with a gradient and must ensure safe drainage of the medium.

6.2.3 Discharge conditions and reaction forces

At low temperatures:

Outlet lines must be protected against freezing. This applies in particular if gas cooling as a result of expansion is to be expected or lines are laid outdoors.

With crystallising media:

In the case of media which tend to crystallise, solidify or stick, appropriate action must be taken to ensure that the solidification process cannot take place in the inlet or outlet lines or in the body (e.g. installed rupture disc, insulation, heating).

6.3 Valve connecting dimensions

The main dimensions are contained in the sectional drawing in **Section 10**.

6.4 Flange caps and gaskets

- Contamination of or damage to the sealing surfaces is best avoided if the protective caps remain on the flanges until just before installation.

If plastic sealing surfaces can be damaged, e.g. with mating flanges made of metal or enamel, use PTFE-lined seals with a metal inlay.
These are available as special accessories from the Richter product range.

6.5 Weights

The test pressure is varied with max. 5 weights, either plastic-lined with metal core (20 mbar each) or of solid PTFE (5 or 10 mbar each).

The weights are marked with the appropriate mbar values.

The round cord **522** secures the weights **239** in the groove of the plug **204** together with the retainer ring **544**.

The test pressure of he valve depends on the back pressure in the valve outlet (see **Fig. 1**).

Set pressure = test pressure + back pressure

Example:

Test pressure = 100 mbar
Back pressure = 10 mbar
Set pressure = 110 mbar

See also enclosed **Drawing 9530-00-4070**

6.6 Direction of flow and installation position

The direction of flow must be observed when installing the valve. It is indicated by a direction arrow on the valve body.

Always install the overflow valve with the plug in a vertical position.

A mix-up of the inlet and outlet will result in the valve becoming ineffective.

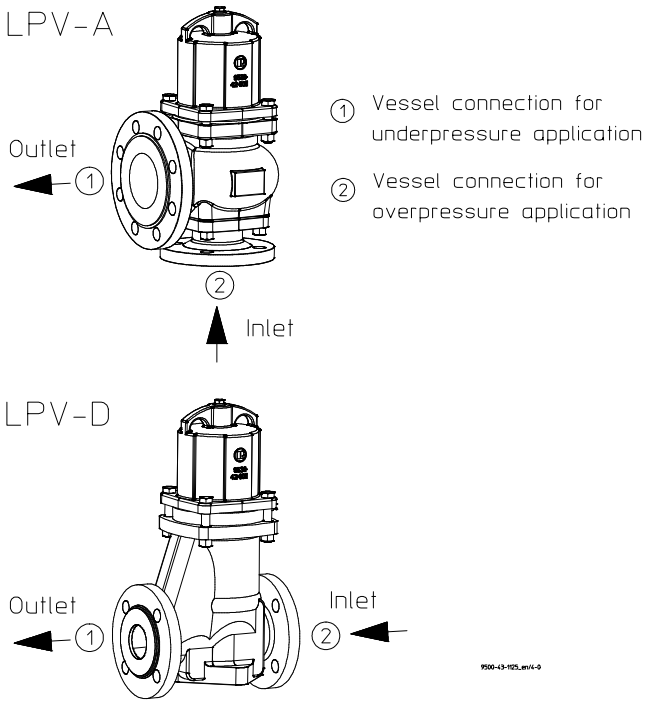


Fig. 1

6.7 Grounding

The valve must be grounded. The simplest solution is to use tooth lock washers which are placed under one pipe bolt of each flange.

At the customer's request a setscrew M6 with a hex. nut and washer will be provided at each flange as an additional grounding connection.

Otherwise grounding must be ensured by different measures e.g. a cable link.

7 Operation

7.1 Initial commissioning

Normally, the valves have been tested for leaks with air or water.

Unless otherwise agreed there could be residual amounts of water in the flow section of the valve; this could result in a possible reaction with the medium.

The max. operating pressure of the plant must always be below the safety valve reseating pressure.

To prevent leaks, all connection screws should be retightened after the initial loading of the valve with operating pressure and operating temperature.
For tightening torques, see **Section 1.4.**

7.2 Shutdown

- The local regulations are to be observed when dismantling the valve.

  Prior to undoing the flange connection ensure, that the plant is depressurised and emptied.
- Prior to the start of maintenance work, the valve must be thoroughly cleaned. Medium residue may be in the valve even if it has been properly drained and flushed.
- After dismantling, immediately protect the valve flanges against mechanical damage by using flange caps. See also **Section 6.4**.

7.3 Recommissioning

When the valve is recommissioned, it must be ensured that **all appropriate steps**, as described in **Sections 6 and 7.1**, are repeated.

7.4 Improper operation and their consequences

- The test pressure, checked by the manufacturer, an approved authority or the supervisory company responsible is secured against unauthorised adjustment by a lead seal.
- A broken lead seal must be replaced without delay. This can either be done by the manufacturer, the approved authority or the supervisory company responsible.

  It is emphasised that in the case of the operating company adding the lead seal itself, it automatically assumes full responsibility for any operational hazard and resulting damage.

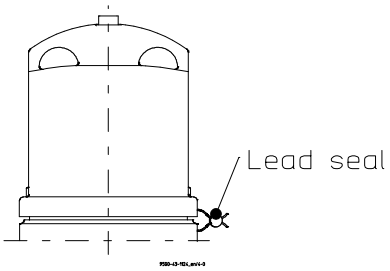


Fig. 2

- The travel set at the manufacturer's works ensures reliable operation of the valve. It is forbidden to arbitrarily alter the travel or to totally block the valve.
- During operation of the valve, no hard foreign matter may be found between the seat and the plug of the valve.
- If foreign matter is deposited on the sealing surfaces during reseating of the valve, the valve is probably not tight. Damage may also occur to the plastic sealing surfaces.

8 Malfunctions

- Safety valve is leaking

  Is there foreign matter between the seat and plug?

  Is there any wear or damage to the seat or plug?

  If so, it is necessary to rework the sealing surfaces of the seat and plug or replace these components.

- The valve stroke is not reached.

  Check of dimensions as per dimensional drawing required. See **Section 10**.

- Medium is escaping at the bonnet

  Are the screws **901/1** and **902/2** tightened with hex. nuts **920/2**?

  Check tightening torques of the bonnet screws with a torque wrench!

  If the leak continues, the recommended tightening torques may be exceeded by 10%.

  If the leak-free state cannot be achieved even after tightening the screws, the plastic lining is damaged.
  Dismantle the valve and have it repaired.

- Flange connection ball valve/pipe is leaking
  Check the torque of the pipe screws with a torque wrench. (See Section 1.4). If tightness is not achieved, the recommended torque may be exceeded by 10%.

  If it still proves impossible to stop the leak, then the lining is damaged. Dismantle the valve and check.

9 Maintenance

Low-pressure safety valves must be checked for operability at regular intervals according to the national regulations (in Germany: UVV - pressure vessels, VBG 17 § 32 and TRD 601 sheet 2, paragraph 3.4).

- The intervals for regular checks are to be laid down by the customer in line with the operating conditions.
- The operability is checked in the dismantled state on a suitable test bed.
- All repair work is to be performed by qualified personnel using the appropriate tools.
- For the arrangement, designation and item numbers of all parts of the valve, see **Section 10**.
- Spare parts are to be ordered with all the details in acc. with the valve identification.
- Only original spare parts may be installed.

9.1 Screw connections

- To prevent leaks, a regular check of the connection screws should be made in line with the operating requirements.
  For tightening torques, see **Section 1.4.**
- To prevent screw connections from becoming loose in the event of pressure fluctuations or plant vibrations, we recommend the installation of expansion joints or pulsation dampers.

9.2 Cleaning

Prior to starting any repair work, the valve is to be thoroughly cleaned. Even if the valve has been properly emptied and rinsed, residual medium may still be found in the valve, e.g. between the lining and body or in the bonnet.

Plastic parts may absorb medium which gradually emerges from the material after cleaning.

Wear the prescribed protective clothing!

Low-pressure safety valves which have been cleaned with water or other media must be dried before re-assembly of the parts and installation of the valve in the plant.

9.3 Modification of the low-pressure safety valve

If modifications to the valve are required, the manufacturer must always be consulted.

Examples: Conversion to changed test gauge pressure, replacement of the weights.

After approval by the manufacturer, these modifications can be performed either by the manufacturer or by the customer under the guidance of a technical supervisory agency or any other approval authority.

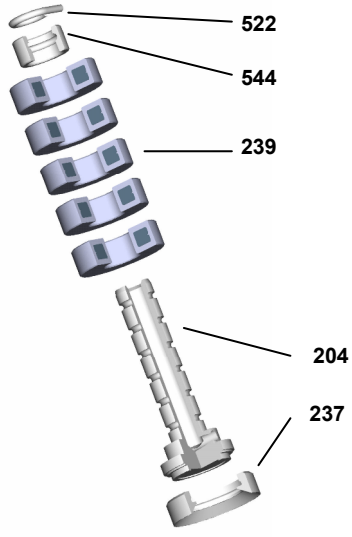
9.4 Changing the test gauge pressure

- Unscrew bonnet **112**.
- Remove subassembly shut-off element.
- Remove retainer ring **544** and round cord **522**.
- Push number of weights **239**, depending on the test pressure, onto the plug **204**.
  See **Section 6.5**.
- Secure with round cord **522** and retainer ring **544**.
- Install subassembly shut-off element in the body **100**.
- Screw on bonnet **112** and tighten.
- Check test pressure.
- Have valve lead-sealed.
- The data specified in the data sheet are to be observed.

9.5 Replacement of components

- Always replace the seat **205** and plug **204** completely.
- Reworking of the seat and plug requires specialised knowledge of the materials, their processing and special lapping wheels. It is therefore recommended to have this work carried out by the manufacturer.
- After dismantling, check all parts for wear and damage.
- Spare parts are to be ordered with all the details in acc. with the valve identification.
- Only use original spare parts.

9.5.1 Subassembly shut-off element



The subassembly shut-off element contains of:

522	round cord
544	support ring
239	weights
204	plug
237	lifting aid

9.5.2 Dismantling of the plug

- Undo screws **901/1** (on the LPV 100/150 902/2) and **920/2** from body **100** and bonnet **112** and remove.
- Remove bonnet **112**..
- Remove subassembly shut-off element (without seat).
- Remove retainer ring **544** and round cord **522**.
- Remove weights **239**.
- Unscrew lifting aid **237**.

9.5.3 Dismantling of the seat

- Dismantle bonnet **112** and subassembly shut-off element from the body **100**. See **Section 9.5.2**.
- Only LPV-A/F: Undo screws **902/1** and **920/1** from inlet nozzle **122** / body **100** and remove.
- Remove seat **205**.
- Only LPV-D/F: For the dismantling and installation of the seat it is necessary to use the screw-in tool (it is not part of the valve supply). See **Section 1.3**.

9.5.4 Installation of the seat

- Centre the new or reworked seat **205** in the body **100**.
- Only LPV-A/F: Then insert the inlet nozzle **122** into the centring of the body **100**.
- The components must be smooth running, i.e. can be centred without any constraining forces.
- If necessary, the inlet nozzle is to be turned through 90°.
- First tighten the attachment nuts **920/1** hand-tight and then with **a** torque wrench evenly and in diametrically opposite sequence.

  It is imperative to observe the prescribed torques for the connection body / inlet nozzle! See **Section 1.4**.
- Only LPV-D/F: Screw-in the seat 1 using the screw-in tool. See **Section 1.3**.

9.5.5 Installation of the plug

- All parts are to be thoroughly cleaned before assembly.
- Screw lifting aid **237** onto the new or reworked plug **204**.
- Push number of weights **239**, depending on the test pressure, onto the plug **204**.
- Secure with round cord **522** and retainer ring **544**.
- Install subassembly shut-off element in the body **100**.

- Only LPV-D/F DN 50: Attach the centering ring **549** onto the body centering.
- Insert guide of the bonnet into the plug and place on the flange.
- First tighten the attachment nuts **920/2** hand-tight and then with a torque wrench evenly and in diametrically opposite sequence.

It is imperative to observe the prescribed torques for the connection body / bonnet! See **Section 1.4**.

9.6 Tests

Following the assembly of the valve, the stroke and the test pressure must be checked. See also **Section 7.4**.

9.6.1 Stroke

Only LPV-A/F: Using a depth gauge through the inlet nozzle, measure the distance in the centre between the plug and the sealing strip on the flange both in the closed and fully opened state.

The valve stroke is derived from the difference between the two dimensions. See **Section 10.2**.

Only LPV-D/F: Valve stroke is determined from the dimensions in **Section 10.2**.

9.6.2 Test pressure

This test should take place on a test bench with a neutral medium such as air or water. Regarding their suitability and precision, the pressure gauges must conform to the requirements of current national regulations (in Germany: e.g. VdTÜV data sheet "Safety Valve 100" of the Association of the German Technical Supervisory Boards).

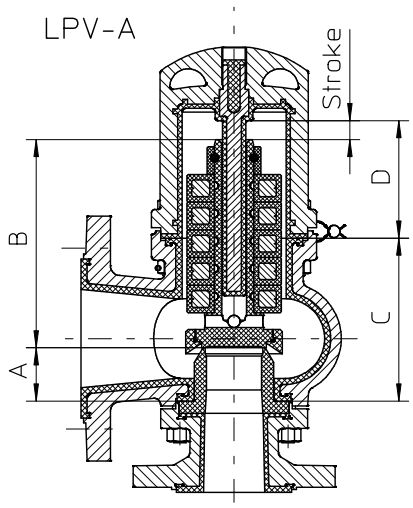
- All pressure tests should be carried out in compliance with DIN EN 12266-1 or API 527.
- It is recommended to perform a bubble test with a 5 mm diameter hose positioned 5 mm below the surface of water. The other end of the hose is sealed to the outlet of the valve by means of a stopper.
- To test the test gauge pressure, the pressure is slowly increased in the valve inlet until the valve starts to open.
- To check the reseating pressure, the pressure in the valve inlet is slowly decreased until the valve is bubble-tight.

10 Drawings

10.1 Legend

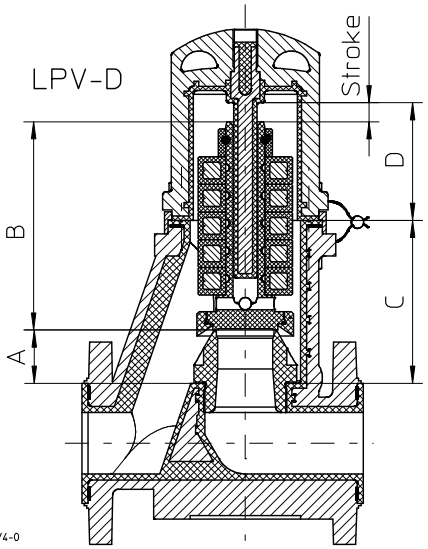
100	body	**549**	centering ring
112	bonnet	**801**	guide
122	inlet nozzle	**901/1**	hex. screw
204	plug	**902/x**	stud screw
205	seat	**920/x**	hex. nut
237	lifting aid	**920/3**	hex. nut, thin
239	weight	**935/1**	lead seal
522	round cord	**936/x**	tooth lock washer
544	support ring	938/1	hex. head screw plug

10.2 Dimension drawing stroke control



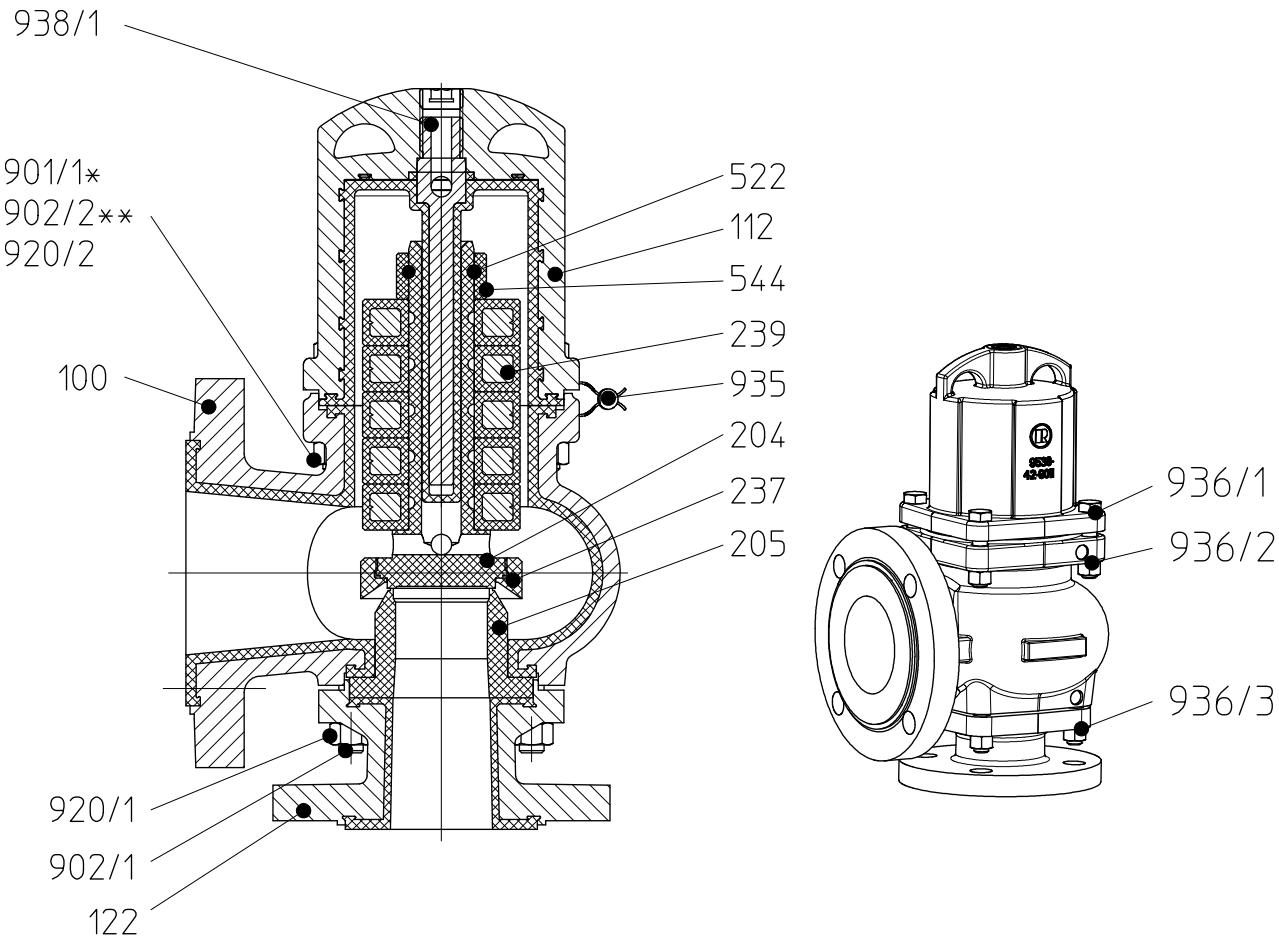
Size	A	B	C	D	Stroke
LPV-A 50/80	43,5	170	133	96	15,5
LPV-A 80/100	60	189	175	94	20
LPV-A 100/150	93	238	259	102	30
LPV-D 50	49	170	133	96	10
LPV-D 80	115	189	213	104	13
LPV-D 100	58	238	213	102	19

All dimensions in mm



9500-43-1129_en/4-0

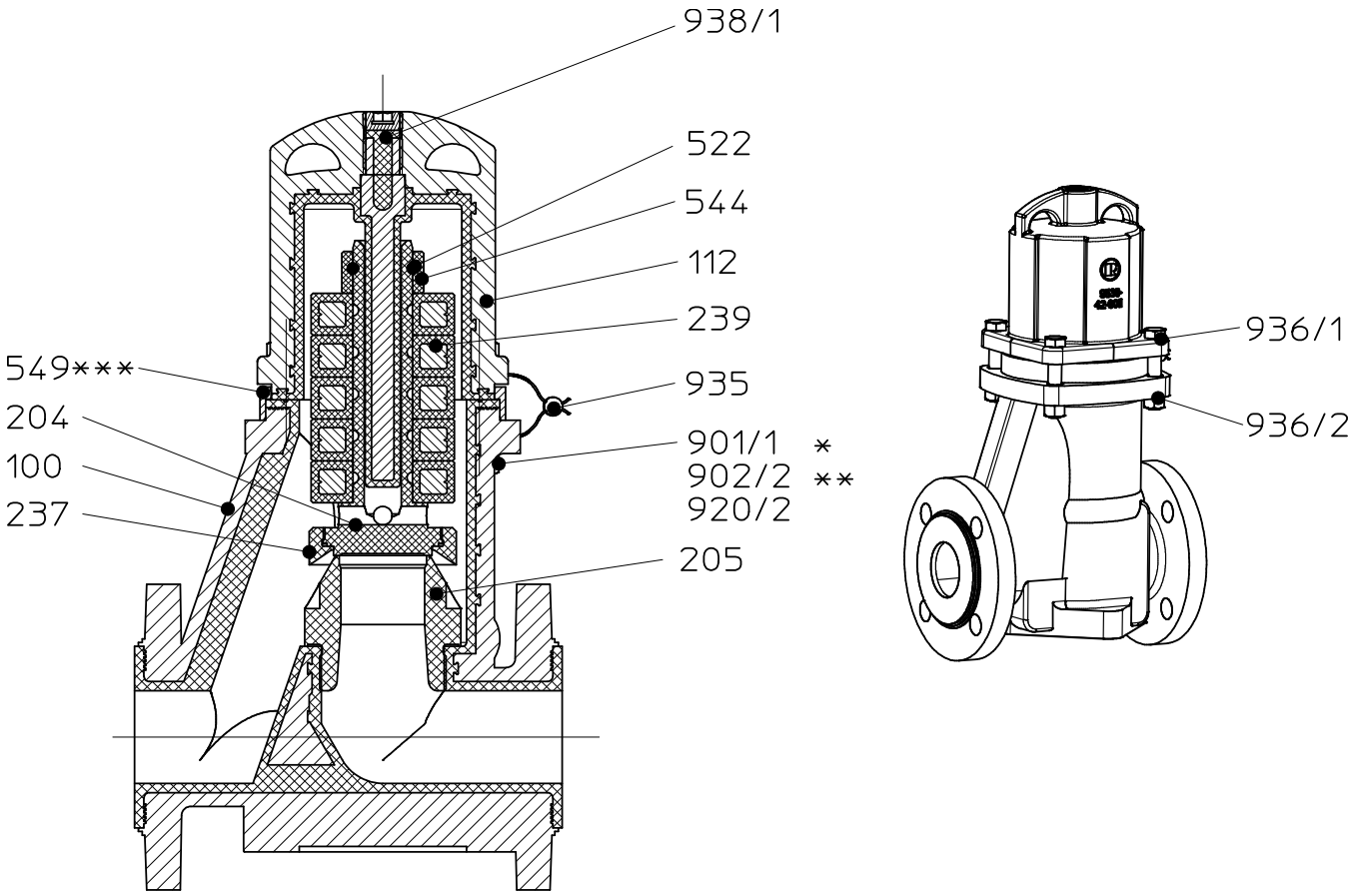
10.3 Sectional drawing LPV-A/F



* nur DN50/80 und DN80/100
only DN50/80 and DN80/100
seulement DN50/80 et DN80/100

** nur DN100/150
only DN100/150
seulement DN100/150

10.4 Sectional drawing LPV-d/F

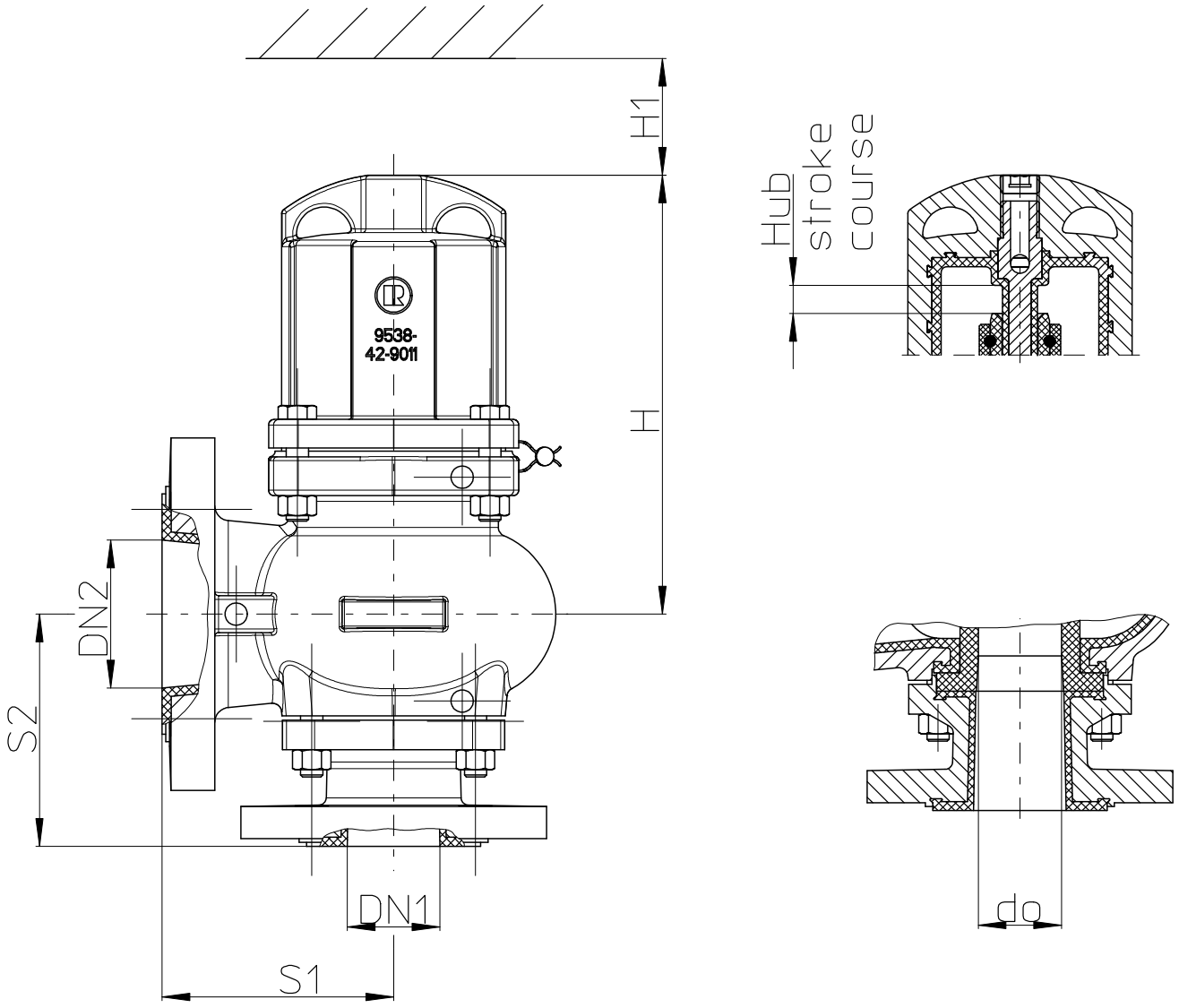


* nur DN50/DN80,
only DN50/DN80,
seulement DN50/DN80

** nur DN50,
only DN50,
seulement DN50

*** nur DN100,
only DN100,
seulement DN100

10.5 Dimensional drawing LPV-A/F

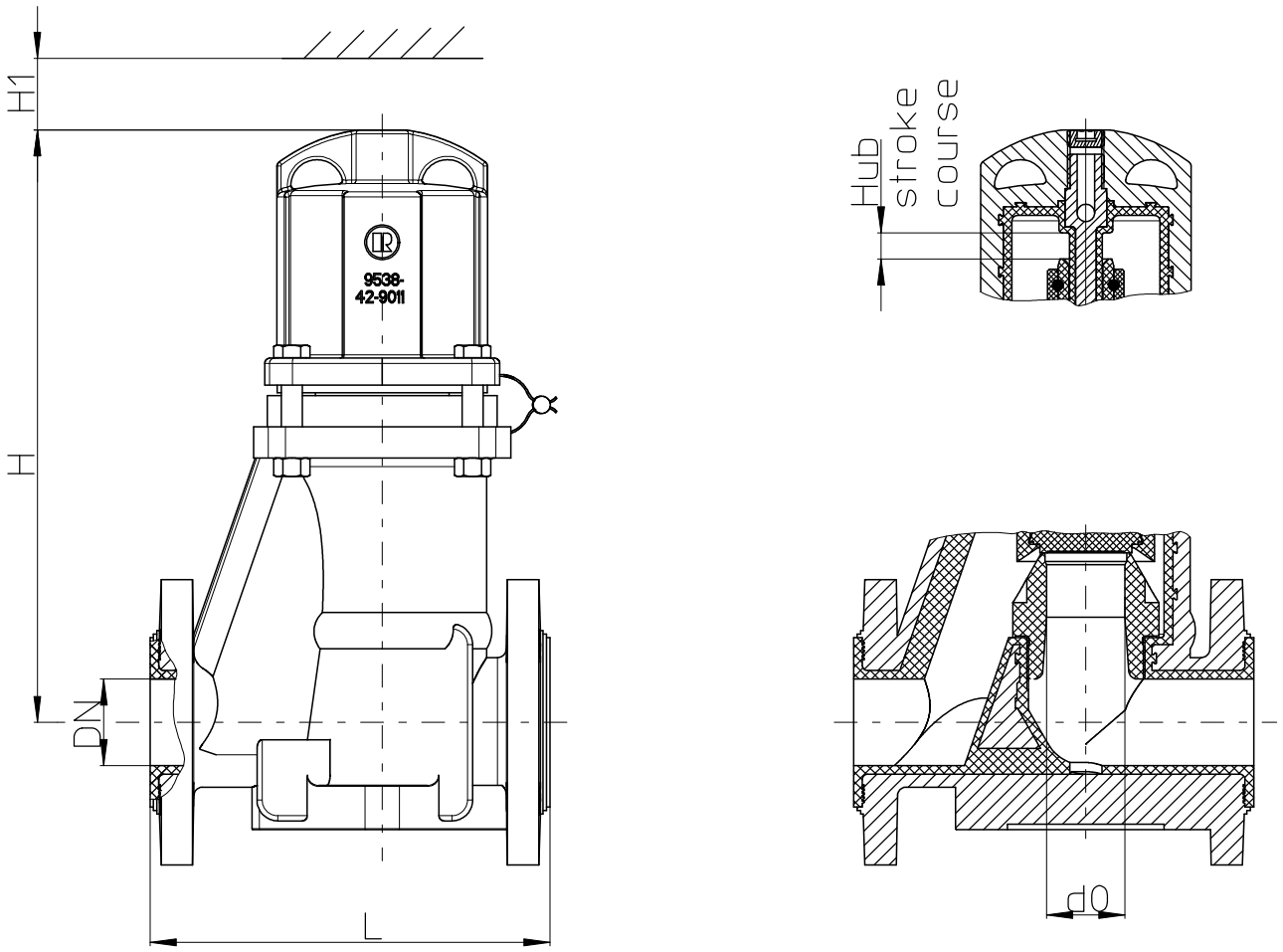


Nom. diameter	DN1	DN2		S1	S2	do	H	H1	Stroke
DN 50/80	**50**	**80**	**[mm] ([inch])**	125 (4.92)	125 4.92)	45 (1.77)	245 (9.65)	120 (4.72)	15.5
DN 80/100	**80**	**100**	**[mm] ([inch])**	155 (6.10)	155 (6.10)	60 (2.36)	274 (10.79)	140 (5.51)	20
DN 100/150	**100**	**150**	**[mm] ([inch])**	200 (7.87)	220 (8.66)	90 (3.54)	342 (13.46)	180 (7.09)	30

All dimensions in mm

Flange connecting dimensions:
DIN EN 1092-2, type B (ISO 7005-2, type B) PN 16 or flanges drilled to ASME 16.5, Class 150

10.6 Dimensional drawing LPV-D/F



Nom. diameter		L	do	H	H1	Stroke
DN 50	**[mm] ([inch])**	230 (9.06)	45 (1.77)	345 (13.58)	120 (4.72)	10 (0.39)
DN 80	**[mm] ([inch])**	310 (12.20)	60 (2.36)	485 (19.09)	140 (5.51)	13 (0.51)
DN 100	**[mm] ([inch])**	350 (13.78)	90 (3.54)	495 (19.49)	180 (7.09)	19 (0.75)

All dimensions in mm

Flange connecting dimensions:
DIN EN 1092-2, type B (ISO 7005-2, type B) PN 16 or flanges drilled to ASME 16.5, Class 150

Baureihe/Series/Série

LPV-A
LPV-D

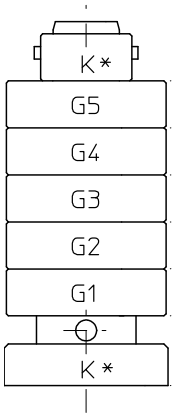
Ausführung **Sicherheitsventil, Gewichtsbelastet**

Design **Safety valve, wight-loaded**

Construction **Soupapes de sécurité poids par ressort**

RICHTER Process Pumps & Valves

Gewichte Auswahl / weight selection / poids sélection



Einstellüberdruck (mbar)
Test Pressure
Surpression de réglage

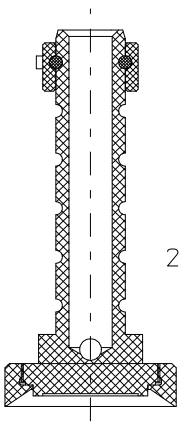
	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	120
G5																5		5	10	20
G4												5		5	10	10	20	20	20	20
G3								5		5	10	10	20	20	20	20	20	20	20	20
G2				5		5	10	10	20	20	20	20	20	20	20	20	20	20	20	20
G1		5	10	10	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
K*	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20

Gewicht Weight Poids (mbar)

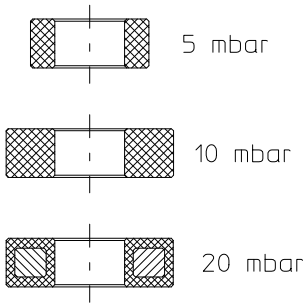
* Ventilkegel inclusive Hubglocke, Haltering, Rundschnur
Plug including lifting aid, retainer ring and round cord
Clapet de vanne y compris cloche, bague support, cordon torique

Gewichte / weight / poids

Ventilkegel K*
Plug
Clapet de vanne



Gewicht G1-G2-G3-G4-G5
Weight
Poids



Baureihe/Series/Série

LPV-A
LPV-D

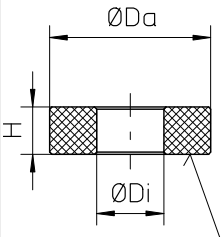
Ausführung **Sicherheitsventil, Gewichtsbelastet**

Design **Safety valve, wight-loaded**

Construction **Soupapes de sécurité poids par ressort**

RICHTER Process Pumps & Valves

Abmessungen Gewichte / dimension weight / dimension poids



Gewichte	5 mbar				10 mbar				20 mbar			
Nennweite	ØDi	ØDa	H	M	ØDi	ØDa	H	M	ØDi	ØDa	H	M
50, 50/80	32	59	22.6	93	32	77	22.6	187	32	77	22.6	373
80, 80/100	37	73.5	24.8	168	37	97	24.8	337	37	97	24.8	673
100, 100/150	43	98.5	28.5	378	43	132	28.5	751	43	132	28.5	1502

Gewicht gekennzeichnet mit Einstellüberdruck
Weight marked with test pressure
Poids marqué de la surpression

ØDi, ØDa, H (Millimeter/millimetre/millimètre)

M = Masse (Gramm)
Mass (gramme)
Masse (gramme)

Konformitätserklärung nach Richtlinie 97/23/EG für Richter Chemie-Technik GmbH Armaturen

Declaration of conformity according the directive 97/23/EG for Richter Chemie-Technik GmbH valves

Hiermit erklärt die Richter Chemie-Technik GmbH die Konformität der gelieferten Armaturen gemäß der Richtlinie 97/23/EG (Druckgeräterichtlinie).

Herewith Richter Chemie-Technik GmbH declares the conformity of the delivered valves according to the directive 97/23/EG (**P**ressure **E**quipment **D**irective).

Baureihe / Series: **LPV-A/F, LPV-D/F**

Anschrift des Herstellers / Manufacturer's adress:

Richter Chemie-Technik GmbH
Otto-Schott-Straße 2
D 47906 Kempen

Alle Armaturen > DN 25 welche in Kategorie I-III fallen, wurden nach Modul H der Richtlinie 97/23/EG zertifiziert.
Valves ≥ 1" of the category I-III are certified according to module H of the directive 97/23/EG.

Sicherheitsventile fallen in Kategorie IV und wurden nach Modul B+D der Richtlinie 97/23/EG zertifiziert.
Safety valves of the category IV are certified according to the modules B+D of the directive 97/23/EG.

Die benannte Stelle welche das Qualitätssicherungssystem und die o.g. Module der Richtlinie 97/23/EG zertifiziert:

The notified body which is responsible for the certification of the quality system and for the above mentioned modules of the PED is:

TÜV Nord Systems GmbH
Meidericher Straße 14-16
D-47058 Duisburg
Kenn.- Nr.: CE 0045

Angewandte Normen oder technische Spezifikationen:
DIN 3840, AD 2000 Regelwerk, DIN EN 12516

Other standards or technical specifications:
DIN 3840, AD 2000 Regelwerk, DIN EN 12516

Diese Erklärung verliert ihre Gültigkeit bei baulicher Veränderung, Verwendung von nicht originalen Richter Ersatzteilen und bei nicht bestimmungsgemäßer Verwendung, sofern vorher nicht ausdrücklich die schriftliche Zustimmung des Herstellers vorliegt.

This declaration will lose its validity if a structural alternation, non original spare parts from Richter or non-defined employment is made, unless the express written approval of the manufacturer is available previously.

i.V. Dipl.-Ing Ingo Zunsen
(Leiter Qualitätsmanagement / Quality Manager)

Dies ist ein Computerausdruck und ohne Unterschrift gültig.
This is a computer print and valid without signature.

Safety Information / Declaration of No Objection Concerning the Contamination of Richter-Pumps, -Valves and Components

1 SCOPE AND PURPOSE

Each entrepreneur (operator) carries the responsibility for the health and safety of his employees. This extends also to the personnel, who implements repairs with the operator or with the contractor.

Enclosed declaration is for the information of the contractor concerning the possible contamination of the pumps, valves and component sent in for repair. On the basis of this information for the contractor is it possible to meet the necessary preventive action during the execution of the repair.

Note: The same regulations apply to repairs **on-site**.

2 PREPARATION OF DISPATCH

Before the dispatch of the aggregates the operator must fill in the following declaration completely and attach it to the shipping documents. The shipping instructions indicated in the respective manual are to be considered, for example:

- Discharge of operational liquids
- remove filter inserts
- lock all openings hermetically
- proper packing
- Dispatch in suitable transport container
- Declaration of the contamination fixed **outside!!** on the packing

Declaration about the Contamination of Richter Pumps, -Valves and Components

The repair and/or maintenance of pumps, valves and components can only be implemented if a completely filled out declaration is available. If this is not the case, delay of the work will occur. If this declaration is not attached to the devices, which have to be repaired, the transmission can be rejected.
Every aggregate has to have it's own declaration.
This declaration may be filled out and signed only by authorized technical personnel of the operator.

Contractor/dep./institute :	Reason for transmitting ☒ Please mark the applicable
	Repair: ☐ subject to fee ☐ Warranty
Street :	**Exchange:** ☐ subject to fee ☐ Warranty
Postcode, city:	☐ Exchange/ Replacement already initiated/received
Contact person:	**Return**: ☐ Leasing ☐ Loan ☐ for credit note
Phone : Fax :	
End user :	

A. Details of Richter-product:

Classification:	**Failure description:**
Article number:	
Serial number:	**Equipment:**
	Application tool:
	Application process:

B. Condition of the Richter-product:	**no**[1]	**yes**	**no**
Was it in operation ?	☐	☐ →	
Drained (product/operating supply item) ?	↓	☐	☐
All openings hermetically locked!		☐	
Cleaned ?	↓	☐	☐
If yes, with which cleaning agent:			
and with which cleaning method:			

[1] if "no", then forward to **D**. ←

Contamination :	**no**[1]	**yes**
toxic	☐	☐
caustic	☐	☐
inflammable	☐	☐
explosive[2]	☐	☐
mikrobiological[2]	☐	☐
radioactive [3]		
other pollutant	☐	☐

[2] Aggregates, which are contaminated with microbiological or explosive substances, are only accepted with documented evidence of an approved cleaning.
[3] Aggregates, which are contaminated with radioactive substances, are not accepted in principle.

↓

C. Details of the discharged materials (must be filled out imperatively)

1. **With which materials did the aggregate come into contact ?** Trade name and/or chemical designation of operational funds and discharged materials, material properties, e.g. as per safety data sheet (e.g. toxic, inflammable, caustic)

X Trade name:	Chemical designation:
a)	
b)	
c)	
d)	

	no	**yes**
2. **Are the materials specified above harmful to health ?**	☐	☐
3. **Dangerous decomposition products during thermal load ?**	☐	☐
If yes, which ones ?		

D. Mandatory declaration: We assure that the data in this explanation are truthful and complete and as a signatory I am able to form an opinion about this. We are aware that we are responsible towards the contractor for damages, which results from incomplete and incorrect data. We commit ourselves to exempt the contractor from claims for damages of thirds resulting from incomplete or incorrect data. We are aware that we are directly responsible towards thirds, irrespective of this declaration, which belongs in particularly to the employees of the contractor consigned with the handling repair of the product.

Name of the authorized person (in block letters): _____

Date _____ Signature _____

Company stamp

FAX

Richter Chemie-Technik GmbH
Otto-Schott-Straße 2
D-47906 Kempen
Telefon +49 (0) 21 52 / 146 - 0
Telefax +49 (0) 21 52 / 146 - 190
richter-info@richter-ct.com
www.richter-ct.com

Fax No. ()

Pages (incl. cover sheet) ()

To:

()

Contact person:	Reference:	Extension:	E-Mail Address:	Date:
()	()	- ()	()	()

Your order No.: **()**
Our Kom. No.: **()** **Serial No.: ()**

Dear Sirs,

The compliance with laws for the industrial safety obligates all commercial enterprises to protect their employees and/or humans and environment against harmful effects while handling dangerous materials.
The laws are such as: the Health and Safety at Work Act (ArbStättV), the Ordinance on Harzadous Substances (GefStoffV, BIOSTOFFV), the procedures for the prevention of accidents as well as regulations to environmental protection, e.g. the Waste Management Law (AbfG) and the Water Resources Act (WHG)

An inspection/repair of Richter products and parts will only take place, if the attached explanation is filled out correctly and completely by authorized and qualified technical personnel and is available.

In principle, radioactively loaded devices sent in, are not accepted.

Despite careful draining and cleaning of the devices, safety precautions should be necessary however, the essential information must be given.

The enclosed declaration of no objection is part of the inspection/repair order. Even if this certificate is available, we reserve the right to reject the acceptance of this order for other reasons.

Best regards
RICHTER CHEMIE-TECHNIK GMBH

Enclosures

()