INSTALLATION AND OPERATING MANUAL

Series GU/F

Overflow and pressure relief valve

DN 25 with certification spring-loaded

Keep for future use!

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

9530-070-en Revision 00 Edition 10/2007

RICHTER
Process Pumps & Valves

List of Contents

Relevant documents

- Data sheet
- Declaration of conformity acc. to the EC Pressure Equipment Directive 97/23/EC
- Form for Safety Information Concerning the Contamination QM 0912-16-2001_en

On request :

- Pressure spring table
- Bellows operating ranges, TIS 0587-02-0006

1 Technical data

Manufacturer:

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

Designation:

Series GU/F, overflow and pressure relief valve with an inline body.

They are direct-acting and spring-loaded and classified as standard valves as regards their opening characteristic.

DN 25 certified for liquids.
Certification number TÜV-SV...993.

Standard overflow valve, design and operation to German AD data sheet A2 (on pressure vessels), ISO 4126

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 alternatively:

- EN 558-1 basic series 1, ISO 5752 series 1 with flanges DIN EN 1092-2, type B (ISO 7005-2 Type B) PN 16 or flanges drilled to ASME B16.5 Class 150
- ANSI/ISA-75.08.09-2004, class 150 with flanges ASME B16.5 Class 150, raised face
- ANSI/ISA-75.08.09-2004, class 300 with flanges ASME B16.5 Class 300, raised face

Materials :

Body material: Ductile cast iron EN-JS 1049 to DIN EN 1563 (0.7043 DIN 1693) or ASTM A395

Lining material: PFA/PTFE
on request conductive design

Bellows: PTFE

Seat and Plug: modified PTFE
Option unmodified PTFE, Hastelloy

Set pressure :

Valve size	Set pressure [bar]
25	0,25 –13
40	0,2 - 13
50	0,1 - 13
65	0,1 - 13
80	0,1 - 10

Temperature range: – 60 °C to + 180 °C

See pressure-temperature diagram in Section 1.5

Valve size in mm :

DN 25, 40*, 50, 65, 80 in mm
1”, 1½", 2”, 2½" 3” in inches Cl 150
1”, 1½", 2” in inches, Cl 300 on request

Weight :

Nom. size		Weight ca. kg	
ISO	ASME	ISO	ASME
25	1"	15	
40	1½"	25	
50	2"	27	
65	---	28	
80	3"	50	

Installation position :

A direction arrow on the body indicates the direction of flow. See Section 6.5.

Dimensions and individual parts:

See sectional drawing in Section 10.

Options :

Gas tight design

Signal transmitter

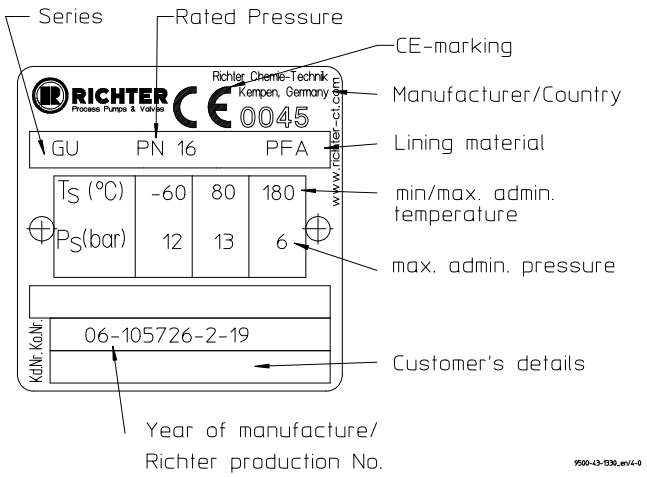
1.1 Name plate CE- and body identification

The stainless steel identification plate is permanently riveted to the body.

Another stainless steel tag plate riveted to the valve indicates the test pressure.

If the customer mounts his identification, it must be ensured that the valve corresponds to the application.

Example name plate with CE-marking:



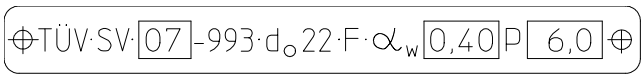
Body identification:

The shell bears the following information in accordance with DIN EN 19 and AD 2000, A4:

- nominal diameter
- nominal pressure
- shell material
- manufacturer's identification
- charge number/foundry identification
- Cast date
- arrow for direction of flow

1.2 Component identification

Certified overflow valve GU DN 25 are identified with a certification plate to the German data sheet A2 (on pressure vessels). This stainless steel plate is riveted to the valve body.
It contains the following details for example:



9500-43-1329/4-0

TÜV = TÜV symbol
SV = Safety valve
07 = Year of certification (here: 2007)
871 = Certification number (here: 993)
d_0 = Narrowest flow Ø in mm (here: 22)
D/G = intended for discharging vapours/gases
F = intended for discharging liquids
αw = Certified coefficient of discharge (here: 0.40)
p = Test pressure in bar (here: 6.0)

1.3 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 ISO/DIN

Flange nom. diameter	Screws	Torque	
[mm]	[ISO/DIN]	[Nm]	[in-lbs]
25	4 x M12	10	90
50	4 x M16	20	175
40	4 x M16	26	230
65	4 x M16	40	355
80	8 x M16	25	220

Pipe screws, flanges to ASME Class 150 or flanges to ISO/DIN, drilled to ASME Class 150

Flange nom. diameter		Screws	Torque	
[mm]	[inch]	[ASME]	[Nm]	[in-lbs]
25	1"	4 x ½“	8	70
40	1½"	4 x ⅝“	15	135
50	2"	4 x ⅝“	25	220
65	---	4 x ⅝“	30	265
80	3"	8 x ⅝“	45	400

Pipe screws, flanges to ASME Class 300

Flange nom. diameter		Screws	Torque	
[mm]	[inch]	[ASME]	[Nm]	[in-lbs]
25	1	4 x ⅝“	15	133
40	1½	4 x ¾“	25	221
50	2	8 x ⅝“	15	133

Cover crews DIN/ISO

Flange nom. diameter		Screws	Torque	
[mm]	[inch]	[ISO/DIN]	[Nm]	[inch-lbs]
25	1“	4 x M10	50	442
40	1½“	4 x M12	50	442
65	---	4 x M12	50	442
50	2“	4 x M12	50	442
80	3“	8 x M12	50	442

Cover screws ASME

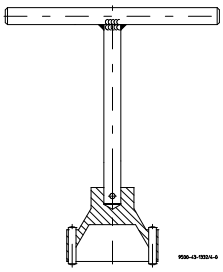
Flange nom. diameter		Screws	Torque	
[mm]	[inch]	[ASME]	[Nm]	[inch-lbs]
25	1“	4 x ½“	50	442
40	1½“	4 x ½“	50	442
50	2“	4 x ½“	50	442
80	3“	8 x ½“	50	442

Hex. socket screws 914/1 of the bellows seal

Nom. size	Screws	Torque	
		[Nm]	[in-lbs]
25	4 x M8	10	89
40	4 x M8	12	106
50	4 x M8	12	106
65	4 x M8	12	106
80	4 x M8	12	106

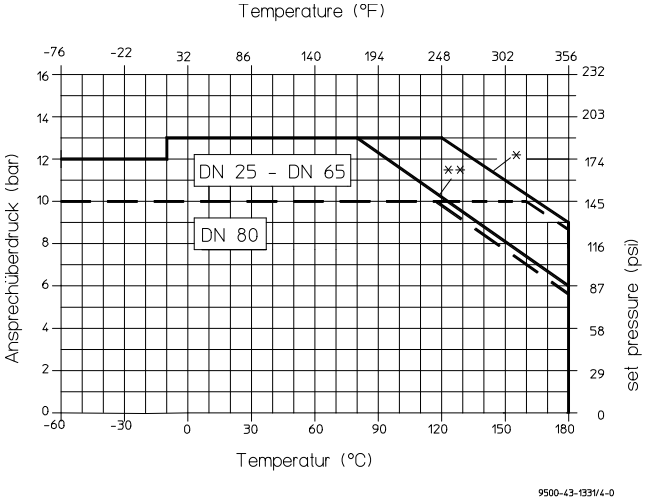
1.4 Screw-in tool for

Nom. size		Article-No.
[mm]	[inch]	
25	1“	---
40	1½“	9568-96-1012
50, 65	2“	9568-96-1016
80	3“	9538-96-1002



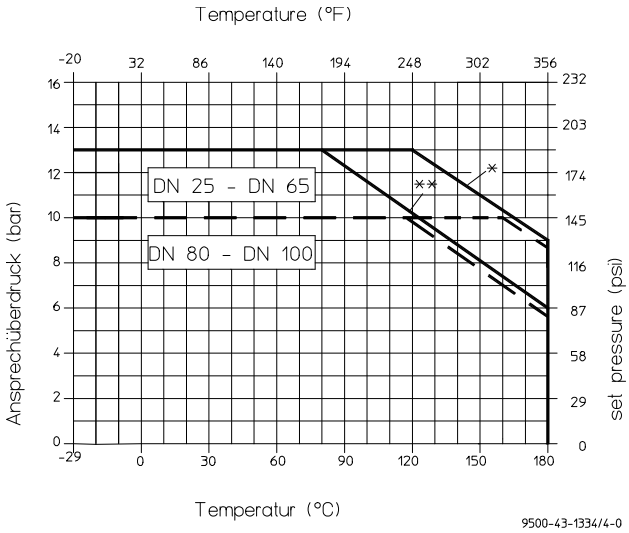
1.5 Pressure/temperature diagram

According to AD 2000



* metal seat
** seat/plug PTFE carbon

According to ASME B 16.42



* metal seat
** seat/plug PTFE carbon

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

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

For applications under -10 °C (14 °F) to -60 °C (-76 °F) a special material must be selected for the thrust flange and spindle.

For applications in the range covered by ASME or ASME/ISA the lowest temperature of ASTM A395 is limited to -20 °F (-29 °C).

2 Safety

This operating manual contains fundamental information which is to be observed during installation, operation and maintenance**. It must therefore be read before installation and commissioning.**
For valves which are used in potentially explosive areas, see **Section 3**.

Installation and operation 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 !
Peoples may be put at risk.

Safety symbol ! The 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.

For example, 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 overflow valves of the GU series are pressure-maintaining components in accordance with the Pressure Equipment Directive (DGRL) for the passage of fluids at a given test pressure.

GU are only intended for vertical installation.

The valves are suitable for non-boiling liquids of group 1 in acc. with the Pressure Equipment Directive (DGRL).

They have a corrosion-resistant plastic lining.

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

The overflow valves are set at the works to the desired set pressure, tested and lead-sealed.
Exact operating conditions of the overflow valve selected are documented in the **data sheet**. There you will find the performance characteristics such as the certified coefficient of discharge, flow area, set pressure, opening pressure, reseating pressure and materials.

If operating data other than those planned arise, the operator must examine carefully whether the design of the valve, accessories and materials is suitable for the new application (consultation with the manufacturer).

2.2 For the customer / operator

If an overflow 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 reliability 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 identification plate must under no circumstances be exceeded.

See also inadmissible modes of 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

Inadmissible modes of 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) may 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).

The following special feature applies to the series with bellows (HV, HVR, BAV, KSE, KSEA, GU, GUT, PA):

The bellows are not offered in a conductive version, i.e. the restrictions under point 1. apply.

Richter optionally offers conductive metallic bellows for the series HV.

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 are to 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 other action, e.g. cable bridges.
- 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 overflow 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.

Never transport the valve using the lifting lever 238.

See sectional drawing and details in **Section 10**.

Transport the valve upright in a box or on a pallet on a soft surface and deposit gently on flat ground.

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

Do not damage epoxy-coating.

5.1 Transport securing

Overflow valves with set pressures ≤ 0.5 bar are fitted at the works with a transport fastening strap which holds the stem in the axial direction and prevents damage to the shut-off element as a result of the stem shaking during transport. See **Fig. 1** and **Section 6.7**.

The flange cover may only be removed when the transport fastening strap has been cut through and removed. This ensures that installation of the valve is only possible when the stem blocking feature has been eliminated.

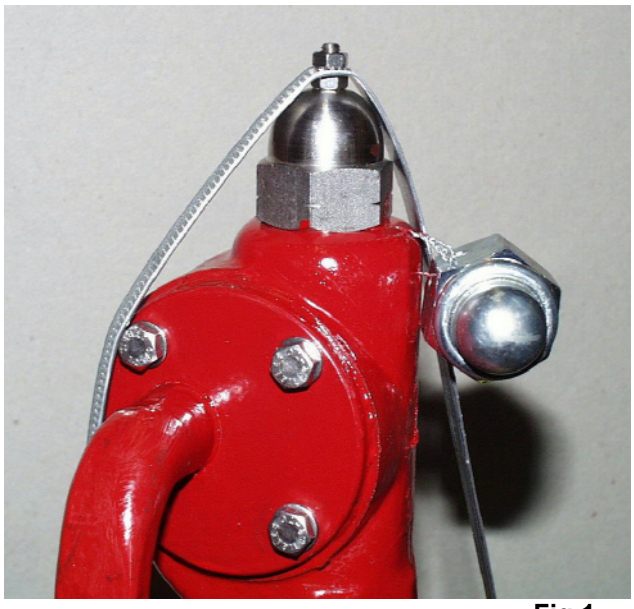


Fig.1

Remove the safety wire between the lifting lever **238** and one connection screw of the lifting cap **513** /body **100 prior to commissioning**.

See **Fig. 2**.

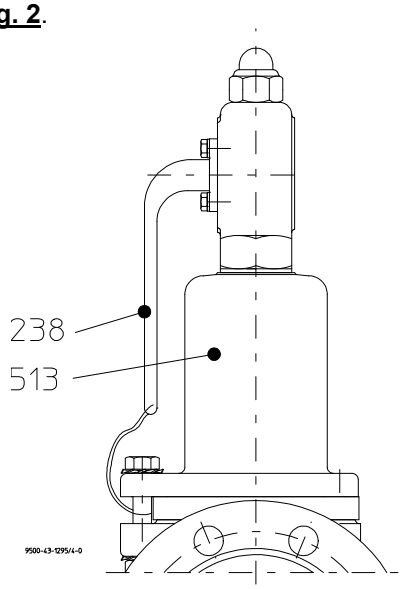


Fig. 2

5.2 Storage

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

It should be stored in a in a dry, vibration-free and well ventilated room at as constant a temperature as possible.

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.

5.3 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.

5.4 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) are to be observed. They are major preconditions for the safe operation of the valve.

- Examine valve for in-transit damage, damaged globe shut-off or control 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.
- During installation, pay attention to the correct tightening torque, aligned pipes and tension-free assembly.

6.1 Sizing of the inlet line

The admissible pressure loss in the inlet line must not exceed 3% of the set pressure of the overflow 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 overflow 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 overflow 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 overflow 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 overflow valve outlet.**
- The admissible back pressure in the valve outlet must not be exceeded in order to prevent destruction of the bellows or a reduction in the discharge capacity.

The overflow valve test certificate and the brochure contain information of the manufacturer on admissible back pressures.

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.

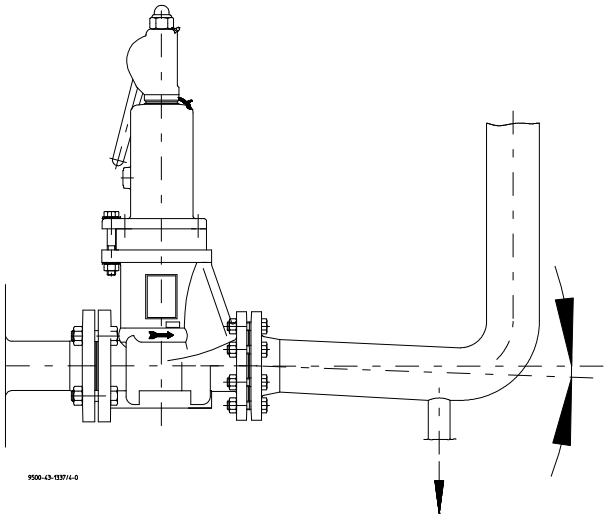


Fig. 3

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).

With gassing media:

In the case of gassing or vaporising liquids, adequately dimensioned flashtraps must be located in the direct vicinity of the valve.

Reaction forces during discharge:

The pipes and their holders are to be dimensioned so that their weight forces and the reaction forces and thermal loads produced during discharge can be safely absorbed.

6.3 Valve connecting dimensions

The main dimensions are contained in the sectional drawing in **Section 10.5**.

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.

We recommend the installation of gaskets so that the sealing surfaces are not damaged by the mating flanges.

If plastic sealing surfaces can be damaged, PTFE-lined seals with a metal inlay should be used. This may be the case with counter-flanges made of metal or enamel.

PTFE-lined seals are available as special accessories from the Richter range.

6.5 Direction of flow and installation

When the valve is being installed, the direction of flow must be observed; it is indicated by an arrow on the valve body.

- A mix-up of the inlet and outlet will result in the valve becoming ineffective and the bellows may be destroyed.
- Always install the overflow valve with the stem in a vertical position.

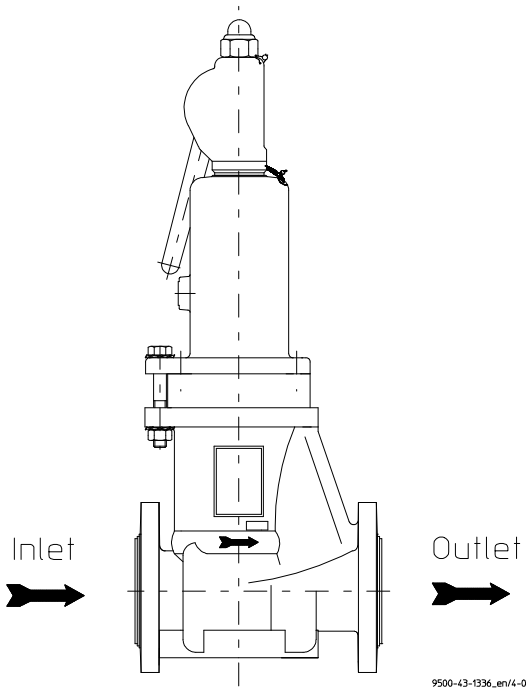


Fig. 4

6.6 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.

6.7 Installation

- The plant components to be protected are to be cleaned thoroughly prior to installation of the valve.
- Solids jeopardise the soft-sealing, high-precision surfaces of the seat and plug and permanent leaks could arise.
- The overflow valve must be installed so that no inadmissible mechanical or thermal stresses are transmitted from the attached pipes to the body.
- Changes in length of the pipes due to temperature are to be allowed for, e.g. through the installation of expansion joints.

➢ Remove the flange covers.

➢ Before installation (vales with set pressures ≤0.5 bar), remove metallic transport securing strip and cap nut for securing the valve during transport. Screw on attached lead-sealed cap nut **927/1**. See **Section 5.1**.

6.8 Gas-tight design (Option)

An O-ring **400/4** seals the lifting lever **238**.

The plug **982/1** is replaced by a hex. head screw plug **938/2**.

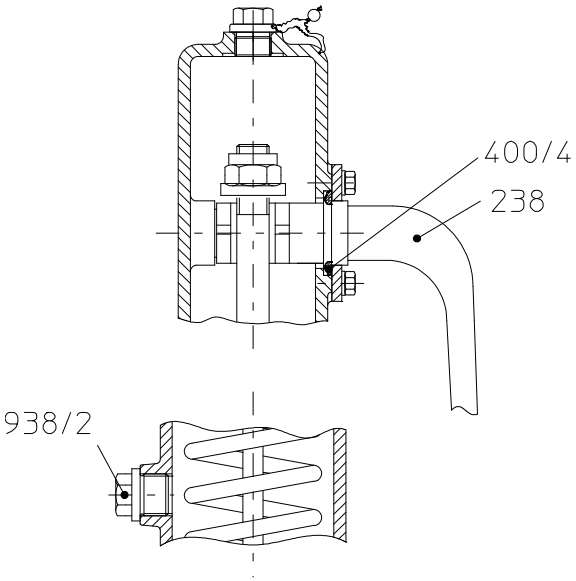


Fig. 5

Legend see **Section 10.1**

6.9 Signal transmitter (Option)

On request, an signal transmitter is available for remote monitoring.

➢ Glue in stem extension **805** (e.g. Loctite 638) and secure with a hex. nut **920/4**.

➢ The support, lower part, **542** is screwed on instead of the cap nut **927/1**.

➢ Insert the O-ring **400/3**.

➢ Mount support, upper part, **541**.

➢ Screw in signal transmitter **859**; after adjustment, counter with hex. nut.

➢ Secure support, upper part, with setscrew **904/1**.

DN 25/50, 50/80, 80/100

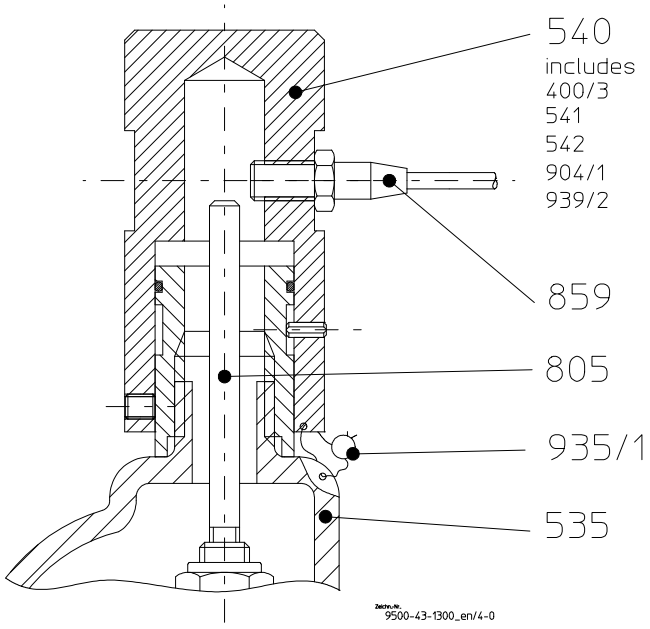


Fig. 8

Legend see **Section 10.1**

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.

Following the initial loading of the valve with operating pressure and temperature, the torques of all connecting bolts must be checked.
See **Section 1.3**.

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 emtied.

- Prior to starting any repair work, the valve is to be thoroughly cleaned. Even if the valve has been properly emtied and rinsed, residual medium may still be found in the valve,
- After dismantling, immediately protect the valve flanges against mechanical damage with flange caps. See also **Section 6.4**.

7.3 Recommissioning

When recommissioning the valve, make sure that all the appropriate steps as described in **Section 6.1 to 6.6 and Section 7.1** are repeated.

7.4 Improper operation and their consequences

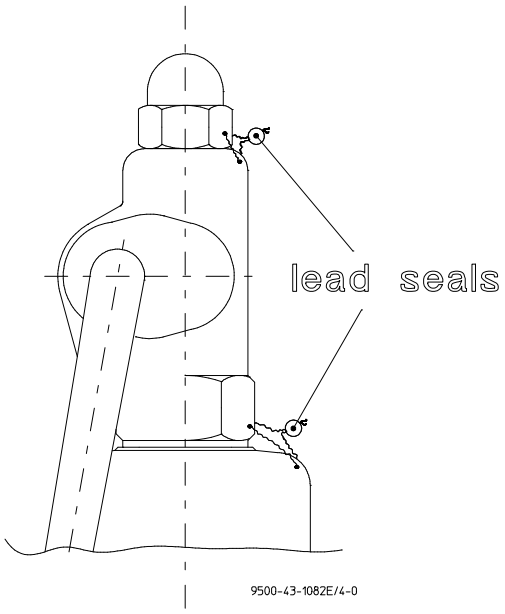


Fig. 8

- 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.

- 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.
- The missing plug **982/1** may result in moisture and dirt in the valve. Replace plug.

8 Malfunctions

- Overflow valve is leaking

  Is there foreign matter between the seat and plug?

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

  Have the nuts at the inlet nozzle been unevenly tightened?

  Actuation of the lifting lever can help to regain the required sealing effect. If this does not succeed in stopping the leak, the sealing surface of the plug must either be reworked or the plug or seat must be replaced.

- The lift given in the test certificate is not achieved

  Are the bellows impeded in their movement by external influences (e.g. foreign matter, solidified medium between the folds etc.)?

  Has the insert sleeve 308 been screwed out of the thread of the bellows?

  For measuring the valve lift, see **Section 9.7.1**.

  If the required lift is still not attainable after elimination of the disorders, an examination at the manufacturer's is necessary.

- Medium is escaping at the bonnet

  Have the hex. socket screws **914/1** not been tightened?

  If, after tightening the screws, tightness still cannot be restored, either the plastic lining or the bellows is damaged.

  The cause of cracked bellows could have been, for example, an inadmissibly high back pressure during operation of the overflow valve. Dismantle the overflow valve and have it repaired.

- Flange connection leaking

Check the torque of the pipe screws with a torque wrench (see **Section 1.3**). 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 overflow valve and check.

- The overflow valve chatters during discharge

Do the inlet and outlet lines conform to the relevant regulations?

See also **Section 6.1 and 6.2**.

Is the valve oversized ?

Valves which are too large can subsequently be adapted to the mass flow reducing the lift. To this end, the required lift is determined and a travel stop ring is mounted inside the valve.

9 Maintenance

Overflow 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 lifting lever **238** allows the valves to be actuated from outside, they then open at the operating pressure available. For lifting, the pressure is to be at least 85% of the test pressure.
- All repair work is to be performed by qualified personnel using the appropriate tools. Generally recognised practice in mechanical engineering is to be observed.
- 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 1.3**.
- 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!

Overflow 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 overflow valve

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

Examples: Modification with changed test pressure, replacement of the spring or adaption to the mass flow by reducing the travel.

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 Adjustment of the test pressure

- Undo locking plate **539**, dismantle lifting lever **238** and unscrew the lifting cap **535**.
- Undo nut **920/3**.
- Adjust the spring tension with the adjusting screw **538** to the specified test pressure.
- Counter adjusting screw **538** with a hex. thin nut **920/3** resp. with centering nut **555** (DN 25).
- Check test pressure.
- Screw on lifting cap **535** and tighten.
- Insert lifting lever **238**.
- Mount locking plate **539**.
- Have the valve lead-sealed.
- The data specified in the test certificates are to be observed.

9.5 Important notes on dismantling / installation

First relieve the plug **204**!

- Then undo the screws between the bonnet **513** and body **100**.
- The seat and plug could otherwise be destroyed. Read the precise instructions in **Section 9.6**.
- Always replace the seat and plug **pairwise** and always rework them **completely**.
- Reworking of the seat and plug requires specialised knowledge of the material as well as 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.
- Observe sectional drawings in **Section 10**.

9.6 Replacement of components

9.6.1 Dismantling of the plug

- Undo locking plate **539,** dismantle lifting lever **238** and unscrew lifting cap **535**.
- Mark the position of the stem nut **534**.
- Unscrew the self-locking hex. nut **929/1** and stem nut **534** off the stem **802**.
- When undoing or tightening the hex. nut, hold the stem tight with a pair of pliers.

Do not turn the entire stem **802**! There is a risk of the insert sleeve **308** being unscrewed out of the bellows **206** or the folds being damaged!

- Mount a suitable distance sleeve (not included in the scope of delivery) over the stem **802**.
- Screw the stem nut **534** against the distance sleeve. The plug **204** is lifted off the seat **205** and the closing force becomes ineffective.
- Loosen the bolts **901/1, 936/1, 936/2** and **920/2** from body **100** and spring bonnet **513** and lift the spring bonnet with internals completely off.
- Grip the bellows **206** in the reinforced section just above the lifting aid **237**. Unscrew the lifting aid off the bellows and remove the plug **204**.

9.6.2 Dismantling of the seat

- Remove spring bonnet **513** from the body **100**. See **Section 9.6.1**.
- Unscrew seat **205** from the body **100** with a special wrench. See **Section 1.4**.

9.6.3 Installation of the seat

- Centre the new or reworked seat **205** in the body **100**.
- First tighten the attachment nuts **920/1** hand-tight and then with a torque wrench evenly and in diametrically opposite sequence.

9.6.4 Installation of the plug

- All parts are to be thoroughly cleaned before assembly.
- Centre the new or reworked plug **204** in the lifting aid **237** and screw completely onto the thread of the bellows hand-tight.
  Counter the bellows **206** on the reinforced section with a pair of pliers.

- Undo the hex. socket screws **914/1**. Centre the spring bonnet **513** with internals on the body **100**. Ensure that there is metallic contact between the body and the spring bonnet. Then tighten the screws **901/1, 936/1, 936/2** and **920/2**.
- Tighten the hex. socket screws **914/1** for the bellows seal evenly in line with the tightening torques in **Section 1.3**.
- Undo stem nut **534**.
- Remove distance sleeve.
- Screw stem nut **534** onto the stem **802** up to the marking. Then counter with the self-locking hex. nut **929/1**.
- Screw on lifting cap **535** and mount lifting lever **238** with locking plate **539**.

9.6.5 Installation of the thrust ring

Make sure that the O-ring **400/1** is positioned completely inside the groove of the pressure ring **124** so that it is not damaged when the thrust ring is inserted into the thrust flange **117**.
If the O-ring **400/1** has been damaged by improper assembly, water may enter from outside into the valve mechanism and the bellows and cause corrosion damage. A defective O-ring must be replaced before the valve is installed in the plant.

9.7 Tests

Following the assembly of the valve, the lift and the test pressure must be checked.

9.7.1 Lift

Lift check:

- Remove the cap nut **927/1** from the lifting cap **535** and determine the height of the stem **802** up to the upper edge of the lifting cap **535**.
- Determine this measurement in both the closed and fully opened state.
- Actuate the lifting lever **238** until the mechanical travel stop can be felt.

The measurement can be made with a slide calliper gauge and a depth indicator to DIN 862.

The lift is derived from the difference in the two heights. It must be at least as high as the lift given in the test certificate.

9.7.2 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 employed pressure gauges must conform to the requirements of current national regulations (in Germany: e.g. VdTÜV data sheet "Overflow 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 use a bubble test with a 5 mm diameter hose positioned 50 mm below the surface of water. The other end of the hose is sealed to the outlet of the valve by means of a plug.
- To check the test pressure, the pressure in the valve inlet is slowly increased until the valve commences 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
117 thrust flange
124 pressure ring
204 plug
205 seat
206 bellows
237 lifting aid
238 lifting lever
305 bearing guide
306 stem guide
307/1 guide bush
308 insert sleeve
395 axial-needle roller cage
396 axial-washer
400/1 o-ring
420 thrust ring, two pieces
513 spring bonnet
534 stem nut
535 lifting cap
536 upper spring plate
537 lower spring plate
538 adjusting screw
539 locking plate
549 cantering ring
554/2 washer
555 centering nut
561/1 grooved pin
802 spindle
900/1 ring bolt
901/x hex. screw
902/x stud screw
914/1 hex. Socket screw
920/x hex. nut
920/3 hex. nut, plain
927/1 cap nut
929/1 prevailing torque type hex. nut
932/x snap ring
934/1 lock washer
935/x lead seal
936/x toothed lock washer
938/1 hex. head screw plug
939/x spring type pin
952/1 pressure spring

Option gas-tight design

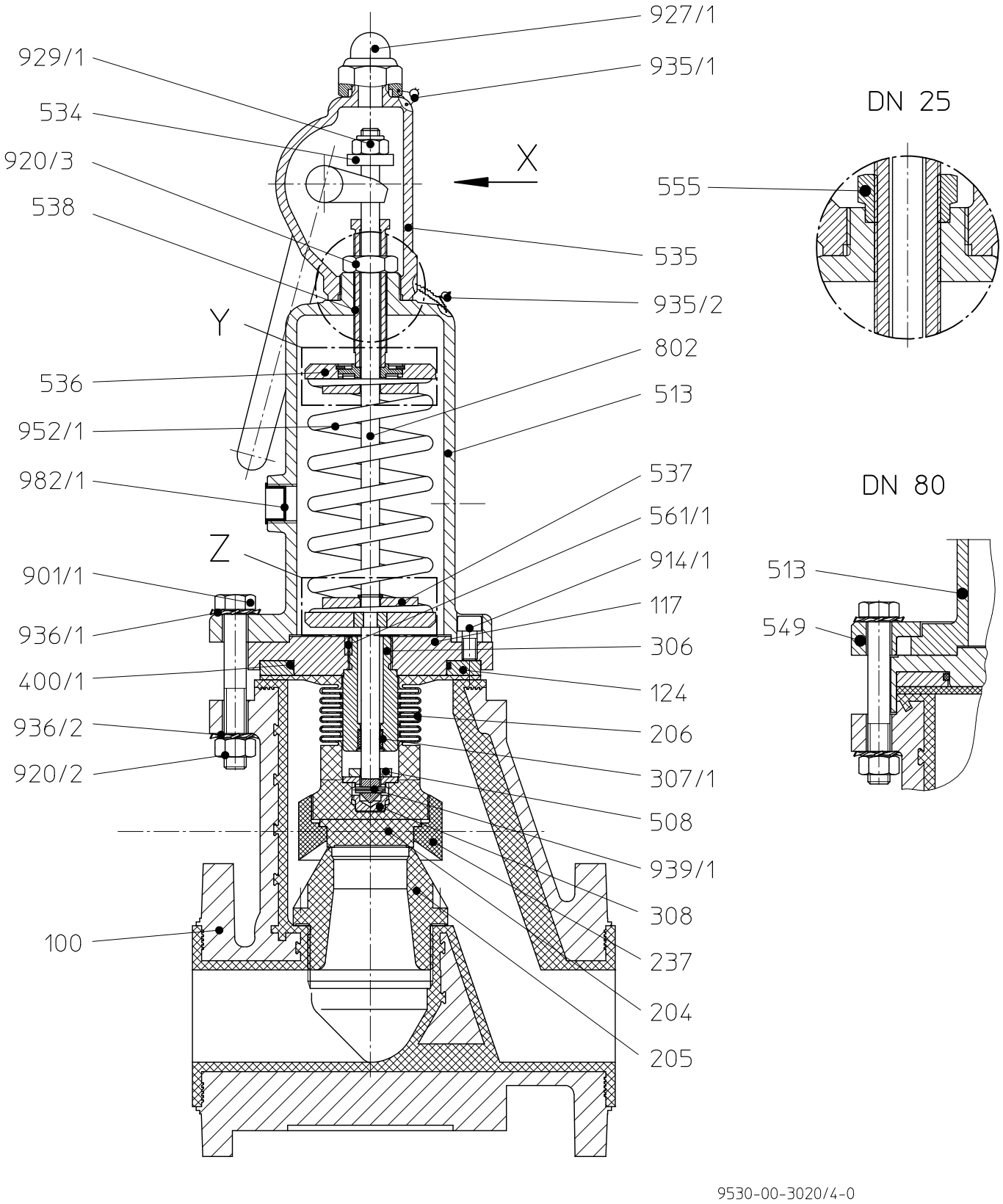
238 lifting lever
400/4 o-ring
938/2 hex. head screw plug

Option signal transmitter

540 support, signal transmitter
includes:
- **400/3** o-ring
- **541** support, upper part
- **542** support, lower part
- **904/1** setscrew
- **939/2** spring-type pin

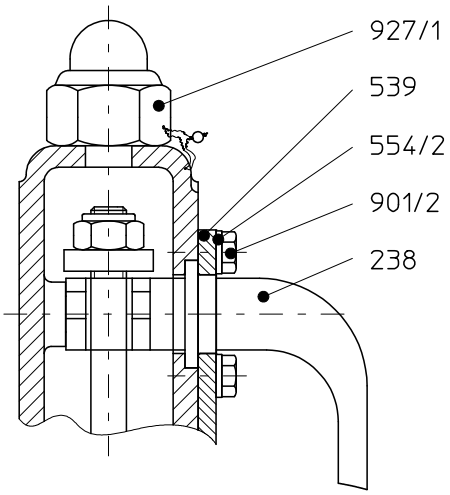
805 stem extension
859 signal transmitter
920/4 hex. nut

10.2 Sectional drawing GU



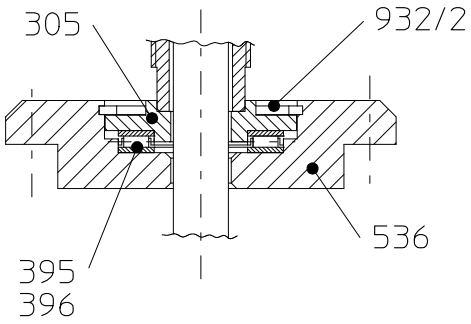
10.3 Views

View X



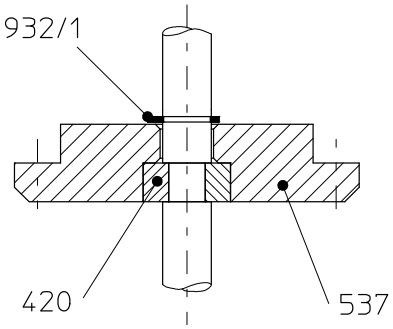
Detail Y

upper spring plate

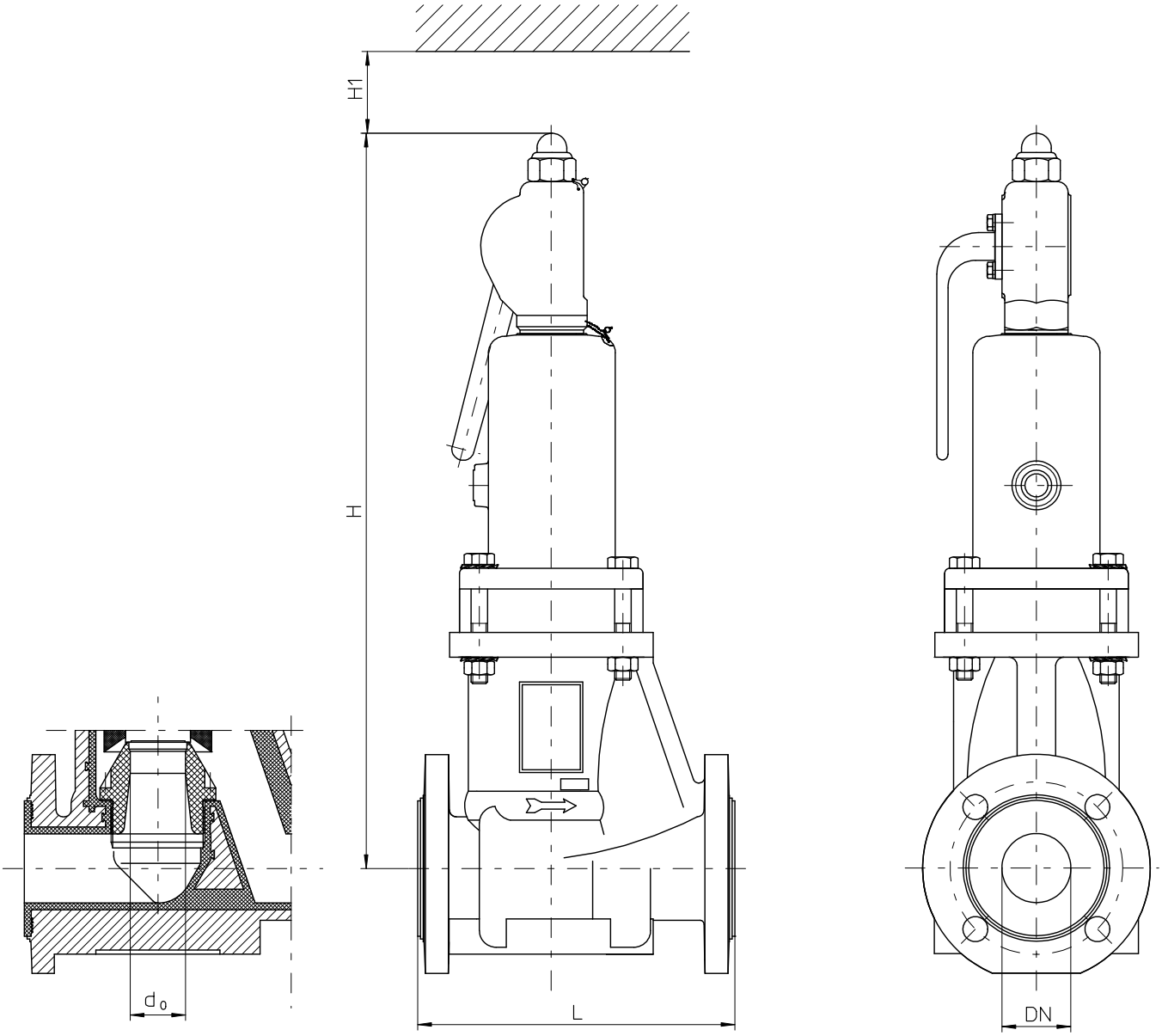


Detail Z

lower spring plate



10.4 Dimensional drawing



Nom. size					EN 558 Reihe 1	ANSI/ISA-75.08.01 Class 150		ANSI/ISA-75.08.01 Class 300	
		d_0	H	H1	L	L		L	
mm	inch	mm	mm	mm	mm	mm	inch	mm	inch
25	1"	22	425	120	160	184	7.24	197	7.76
40	1½"	32	509	120	200	222	8.70	235	9.25
50	2"	40	535	120	230	254	10.00	267	10.50
65	---	40	535	120	290	---	---	---	---
80	3"	50	705	140	310	298	11.73	---	---

Flange connecting dimensions:
with flanges DIN EN 1092-2, type B (ISO 7005-2 Type B) PN 16 or flanges drilled to ASME B16.5 Class 150
with flanges ASME B16.5 Class 150 or 300, raised face

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

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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

()