How to assemble: Type 459

Assembly instruction of the Type 459

Objectives of the presentation. Increase special knowledge**.**

The aim of this presentation is to give an overview about the assembly of **LESER Compact Performance Safety Valves Type 459**.

General. Compact Performance.

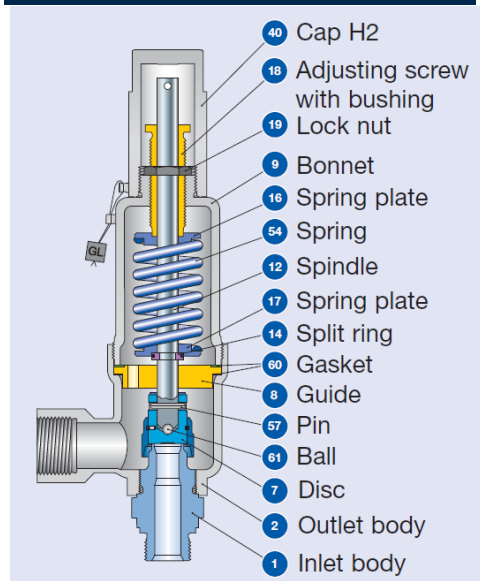
LESER **Compact Performance** safety valves offer ultimate protection against overpressure in all applications for steam, gases and liquids where smaller capacities are required.

Advantages:

- Great variety of threaded or flanged connections available
- Soft seat for superior tightness possible
- Valve sizes from ⅜“ through 1 ½“
- Wide range of materials and options to fit any application

General Illustration.

type 459



Conventional Design
Threaded connection

Assembly of the Type 459. 1. Assembly of the adjusting screw.

Step 1-1

- Put the bushing in the adjusting screw.

Step 1-2

- Assemble the adjusting screw and lock nut.

Step 1-3

- Grease adjusting screw thread.
- Tools: Brush, Halocarbon (OI-56 S / 60H)

Assembly of the Type 459. 1. Assembly of the adjusting screw.

Step 1-4

- Grease the front side of the adjusting screw
- Tools: Brush, Halocarbon (OI-56 S / 60H)

Step 1-5

- Screw the adjusting screw into the cap

2.1 Inlet body assembly for threaded connector (cylindrical thread)

Step 2.2-1

- **Visual check of inlet body**: Check sealing surface for cleanliness or damage.
- Grease the sealing lip and thread of the inlet body.
- Tools: Brush Halocarbon (OI-56 S / 60H)

Step 2.2-2

- Screw the inlet body into the outlet body hand tight.

Step 2.1-3

- Screw the apparatus onto the inlet body
- Clamp the body onto the test bench.

Step 2.1-4

- Tighten the outlet body using appr. 100-200 Nm.
- Tools: Open-end spanner

2.2 Assembly of inlet body flanged connector (cylindrical thread)

Step 2.2-1

- Visual check: Check sealing surface for cleanliness and damage.
- Grease the sealing lip and thread and clamp the inlet body onto the test bench.
- Tools: Brush Halocarbon (OI-56 S / 60H)

Step 2.2-2

- Screw on the outlet body and tighten at approx. 100 Nm.

3.1 Metallic seal type 459 (Standard)

Step 3.1-1

- Disc, body, lifting aid, locking ring

Step 3.1-2

- Put the disc body in the lifting aid.

Step 3.1-3

- Put the disc in the assembly apparatus and secure with a screw.
- Tools: Vice

Step 3.1-4

- Insert the retaining clip in the hole on the disc body designated for that purpose.
- Clamp the apparatus onto the vice and tighten the lifting aid with a C-spanner as far as it will go.
- Tools: C-spanner with a nose

Step 3.2-1

- Insert the sealing plate in the disc body (freely turning up)

Step 3.2-2

- Emboss the code letters of the sealing plate on the edge of the disc.

Step 3.2-3

- Unwind sealing tape from the thread of the outlet nozzle.

Step 3.2-4

- Insert the retaining clip in the hole on the disc body designated for that purpose.

Step 3.2-5

- Clamp the apparatus onto the vice and tighten the lifting aid with a C-spanner as far as it will go.
- Tools: Vice, C-spanner with a nose

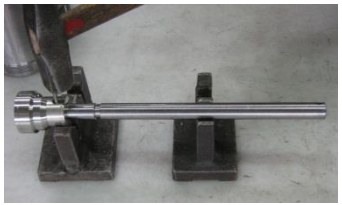
4.1 Assembly of spindle/disc assembly (without bellows)

Step 4.1-1

- Insert the ball into the disc body.

Step 4.1-2

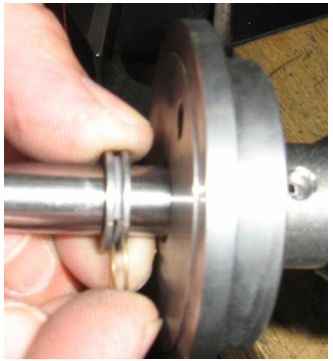
- Put the spindle into the disc and secure with a pin (crimp it first inwards at one end to make installation easier)



Step 4.1-3

- Push the guide washer onto the spindle

4.1 Assembly of spindle/disc assembly (without bellows)



Step 4.1-4

- Put half-washers in the recess of the spindle and secure with a retaining clip

Step 4.1-5

- Push the lower spring plate, the spring and the upper spring plate onto the spindle.

4.2 Assembly of spindle/disc assembly
(with stainless steel bellows)

Step 4.2-1

- Grease spindle.
- Tools: Brush, Halocarbon (OI-56 S / 60H)

Step 4.2-2

- Put a very small amount of glue on the spindle thread (1 Drop).
- Tools: Glue

Step 4.2-3

- Put on the bellows and quickly tighten it and tight with two pin punches.
- Tools: Pin punch

4.2 Assembly of spindle/disc assembly (with stainless steel bellows)

Step 4.2-4

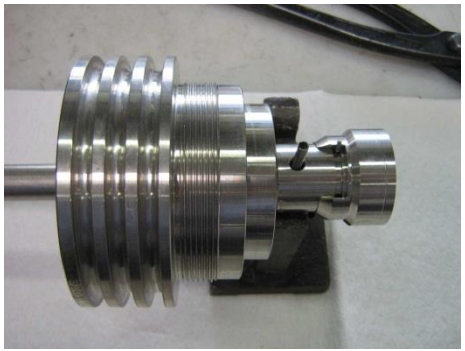
- Put half-washers in the recess of the spindle and secure with a retaining clip.

Step 4.2-5

- Place the sealing ring in the cooling zone/bonnet spacer

Step 4.2-6

- Put the spindle with the bellows through the cooling zone into the disc. Afterwards, put it onto the assembly apparatus and secure with a pin (crimp it first inwards at one end to make installation easier).



4.3 Assembly of spindle/disc assembly (with elastomer bellows)

Step 4.3-1

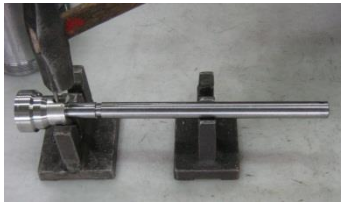
- Insert the ball into the disc body.

Step 4.3-3

- Push the bellows onto the assembly aid until the thick end is flush.
- Tools: Assembly aid

Step 4.3-2

- Put the spindle into the disc and secure with a pin (crimp it first inwards at one end to make installation easier)



Step 4.3-4

- Assembly aid on the spindle

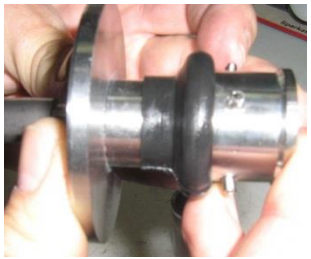
4.3 Assembly of spindle/disc assembly (with elastomer bellows)

Step 4.3-5

- Put the bellows over the disc by means of the assembly aid

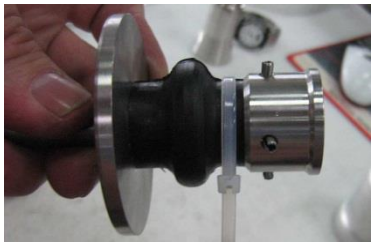
Step 4.3-6

- Remove the assembly aid from the spindle and put guide washer on.
- Put the other end of the bellows over the neck of the guide washer.



Step 4.3-7

- Secure both sides of the bellows with a cable tie.
- Cut off the overlapping end



5.1 Inserting the assembly (without bellows)

Step 5.1-1

- Carefully put the assembly into the outlet body. In the process, push the guide washer down and lift the spindle somewhat so that the disc does not touch down
- Carefully put the disc with the spindle onto the seat.

5.2 Inserting the assembly (with stainless steel bellows)

Step 5.2-1

- Put the assembly on the outlet body and tighten hand tight. In the process, pull the spindle up somewhat so that the sealing surface is not scratched.
- Carefully put the disc with the bellows and spindle onto the seat.
- Tighten the bonnet spacer with the C-spanner.
- Tools: C-spanner with a nose

Step 5.2-2

- Push the lower spring plate, the spring and the upper spring plate onto the spindle

5.3 Inserting the assembly (with elastomer bellows)

Step 5.3-1

- Carefully put the assembly into the outlet body. In the process, push the guide washer down and lift the spindle somewhat so that the disc does not touch down. Carefully put the disc with the spindle onto the seat.

Disassembly of the type 459 8. Disassembly of the pressure screw

Step 6.1-1

- Grease the front side and threads of the bonnet and put on carefully.

Step 6.1-2

- Screw the bonnet on hand tight. Secure the spindle/disc against turning.

Step 6.1-3

- Afterwards, tighten the bonnet.
- Tools: Open-end spanner

6.2 Bonnet assembly (with stainless steel bellows)

Step 6.2-1

- Grease the front side and threads of the bonnet and put on carefully.
- Tools: Brush Halocarbon (OI-56 S / 60H)

Step 6.2-2

- Screw the bonnet on hand tight. Secure the spindle/disc against turning.
- Afterwards, tighten the bonnet.
- Tools: Open-end spanner

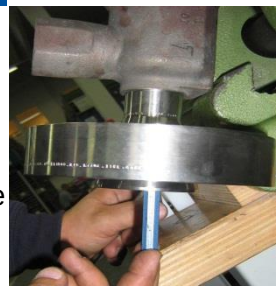
7.1 Installation of the lift stopper with ring/sleeve

Step 7.1-1

- First of all, insert the spindle assembly into the body **without the spring plate and spring** and screw on the bonnet. After installation of the bonnet, determine the spindle overlap in a non-opened state with a depth gauge.
- Tools: Sliding Vernier calliper

Step 7.1-2

- Completely open the valve by hand (e.g. with a pin punch) through the inlet and then determine the spindle overlap once again.
- The extent of the lift stopper = spindle overlap (opened) - (spindle overlap not opened) stroke given in the work plan.



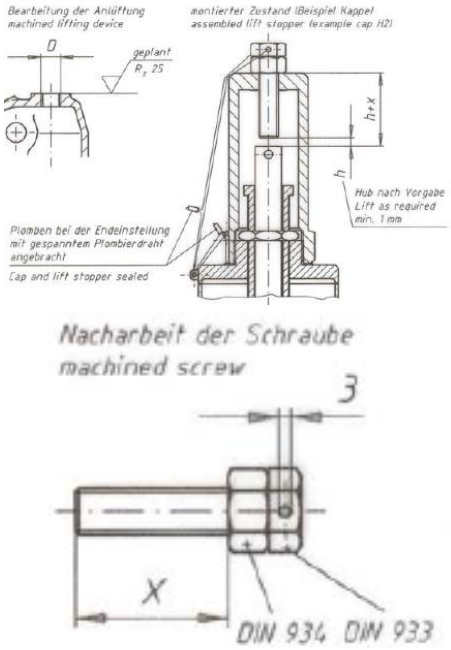
Step 7.1-3

- Afterwards, tighten the bonnet.
- Tools: Open-end spanner

7.2 Installation of the lift stopper with set screw

Step 7.2-1

- Use a completely assembled valve to measure the distance "h+x" from the top edge of the cap/lever to the end of the spindle. In accordance with this distance, a 6kt screw DIN 933 is shortened to the size "x". Install the shortened 6kt screw and seal separately. During the assembly, the 6kt screw is secured firmly against the cap. with the 6kt nut.
- Here, the gap between the head of the screw and the nut must be a maximum of 0.5 mm (approx 1/4 of a screw turn).
- Seal the screw with PTFE tape.



Step 8-1

CAUTION:

- The following instructions apply to all valves covered in this work instruction except for 4594, do6. LGS 3614 applies in that case.
- Secure the splint pin against turning when adjusting the adjusting screw.
- Pressurise the valve and adjust to the set pressure with the adjusting screw in accordance with the specification
- Check whether the valve opens at the set pressure. The set pressure of the valve has been reached when you can hear air escaping. Full opening must be achieved.

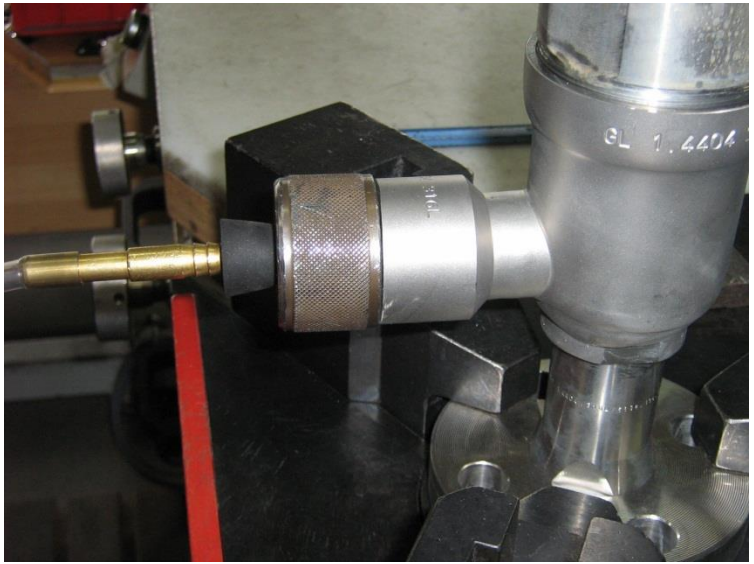
Step 8-1

- If the valve opens outside the stipulated set pressure tolerance, then the adjusting screw must be adjusted again.
- Turning in a clockwise direction causes the valve to open at higher pressure.
- Turning in a counter-clockwise direction causes the valve to open at lower pressure.
- Release the pressure when readjusting the adjusting screw. Readjust the adjusting screw and then pressurize the valve again.

Assembly of the Type 459. 9. Testing and documenting the seat tightness

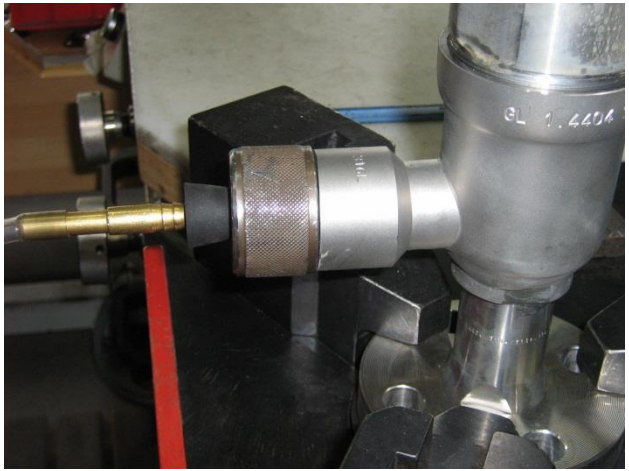
Step 9-1

- Raise the valve to its set pressure 3 times.
- After the 3rd opening, throttle the valve from the set pressure to the test pressure.
- Screw the test cap onto the outlet body.
- Seal the valve outlet with the test plug thereby connecting it to the water tank.
- Adjust the valve to the given test pressure.
- Check the functional seal tightness according to the order specifications and LGS 0201.
- If there are leaks, check the components. If necessary relap the disc and/or seat.



Step 9-1

- If the seal tightness has been met, then document the results.
- Tools: Test cap, Water tank



Assembly of the Type 459. 10.1 Outlet (outlet adapter with cylindrical thread)

Step 10.1-1

- Grease the thread and front side of the outlet adapter.
- Tools: Brush Halocarbon (OI-56 S / 60H

Step 10.1-2

- Place flange over the outlet of the body.
- Screw the adapter into the outlet body and tighten.
- Tools: Open-end spanner

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Assembly of the Type 459. 10.2 Outlet flange (adapter with conical NPT thread)

Step 10.2-1

- Wrap the thread of the outlet adapter with sealing tape (3 full windings in a clockwise direction).
- Tools: PTFE-tape

Step 10.2-2

- Place flange over the outlet of the body. Screw the adapter into the outlet body and tighten. Cut off the sealing tape that is not screwed in.
- Tools: Knife

Step 11.1-1

- Grease the thread and sealing lip of cap H2.
- Tools: Brush, Halocarbon (OI-56 S / 60H)

Step 11.1-2

- Screw the lever onto the thread of the bonnet and tighten using approx. 80 – 100 Nm.
- Tools: Torque wrench

Step 11.2-1

- Spindle cap with cylinder pin and retaining ring

Step 11.2-2

- Fasten the spindle cap to the spindle with the cylinder pin and retaining ring.

Step 11.2-3

- Individual parts of lever H3

Step 11.2-4

- Screw the lever on and put it into position ("nose" must point in the outlet direction).
- If necessary use spacer

Assembly of the Type 459. 11. Assembly of the cap/lever – 11.2 Lever H3

Step 11.2-5

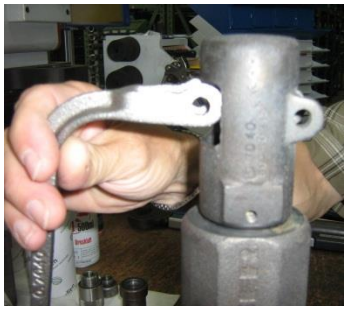
- Secure the lever with the plastic ball …

Step 11.2-6

- ... and locking screw against twisting

Step 11.2-7

- Putting on the venting lever.



Step 11.2-8

- Put bolt through and secure on both sides with retaining washers.

Assembly of the Type 459. 11. Assembly of the cap/lever – 11.3 Lever H4

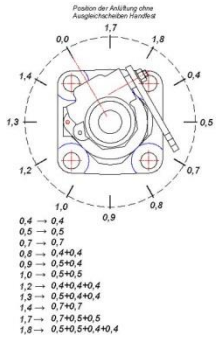
Step 11.3-1

Step 11.3-2

- Fasten the spindle cap to the spindle with the cylinder pin and retaining ring.

Step 11.3-3

- Screw on the lever and put it into position as per the illustration with spacers (the home position in a completely assembled state is at 1.7).



Step 11.3-4

- Put on the determined number of spacers.
- Grease each spacer as well as the metallic sealing surface individually.
- Screw on the lever and tighten at approx. 80 – 100 Nm.

Step 11.4-1

- Put the eccentric hole into such a position that the spindle cap is exactly in the middle.

Step 11.4-2

- Secure the position with a lock nut.
- Screw in the lift indicator as far as it will go, and then unscrew it one turn

Step 11.4-3

- Secure the position of the lift indicator by tightening the first nut hand tight.
- Then lock with a second nut.

Assembly of the Type 459. 12. Test-Gag-/Locking screw (possible for H2+H4)

Step 12-1

- Grease the sealing surface of the short bolt.
- Tools: Brush Halocarbon (OI-56 S / 60H)

Step 12-2

- Put on the sealing ring and grease it as well.
- Tools: Brush, Halocarbon (OI-56 S / 60H)

Step 12-3

- Screw the test gag into the cap or lever and tighten with 28-32 Nm (or 72-76 Nm for thread size M16).
- If blocked, the torque for the longer screw is 20 Nm.
- Tools: Torque wrench

13.1 Testing the seal tightness to the outside or flanged valves through immersion

Step 13-1

- Seal the valve at the inlet with a sealing cap

Step 13-2

- Screw a test nozzle onto the outlet.

Step 13-3

- Hook the valve in the testing apparatus

13.1 Testing the seal tightness to the outside for flanged valves through immersion

Step 13.1-4

- Immerse the valve
- Test pressure 6 bar

Test pressure for valves with elastomer components:

Set pressure p_0<3 bar: 0,15 x p_0

Set pressure p_0≥ 3bar: 2bar

If the seal tightness is good (no bubbles), document the test result in SAP / Q-characteristics. tab.

If there are any leaks, check the affected sealing surfaces and seals for damage and then test again.

Dry the valve with compressed air.

13.2 Testing the seal tightness to the outside for flanged valves

Step 13.2-1

- Clamp the outlet side of the valve to the test bench.
- Pressurize the valve with 6 bar.

Step 13.2-2

- Wet the valve with leak detector on the interconnection points and the outlet area.

13.2 Testing the seal tightness to the outside for flanged valves

Test pressure for valves with elastomer and EPDM components:

Set pressure p_0<3 bar: 0,15 x p_0
Set pressure p_0≥ 3bar: 2bar

If the seal tightness is good (no bubbles), document the test result.
If there are any leaks, check the affected sealing surfaces and seals for damage and then test again. Dry the valve with compressed air.

Step 14-1

- Closely connect the sealing hole or lug from the cap/lever and bonnet in a clockwise direction.
- Seal the lever/cap to the outlet body.

15. Performing a visual inspection

Check the valve once again for damage, freedom from burrs, casting faults etc. and replace defective parts if necessary. Perform visual inspection and document.

How to assemble Compact Performance
Thank you for your attention